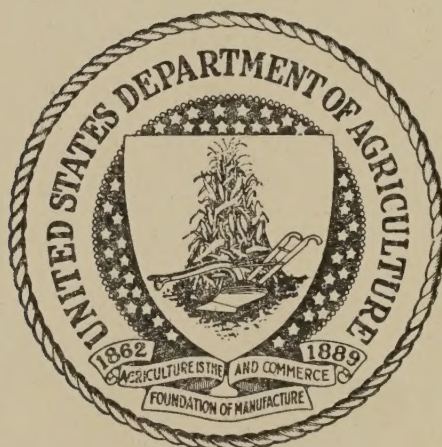


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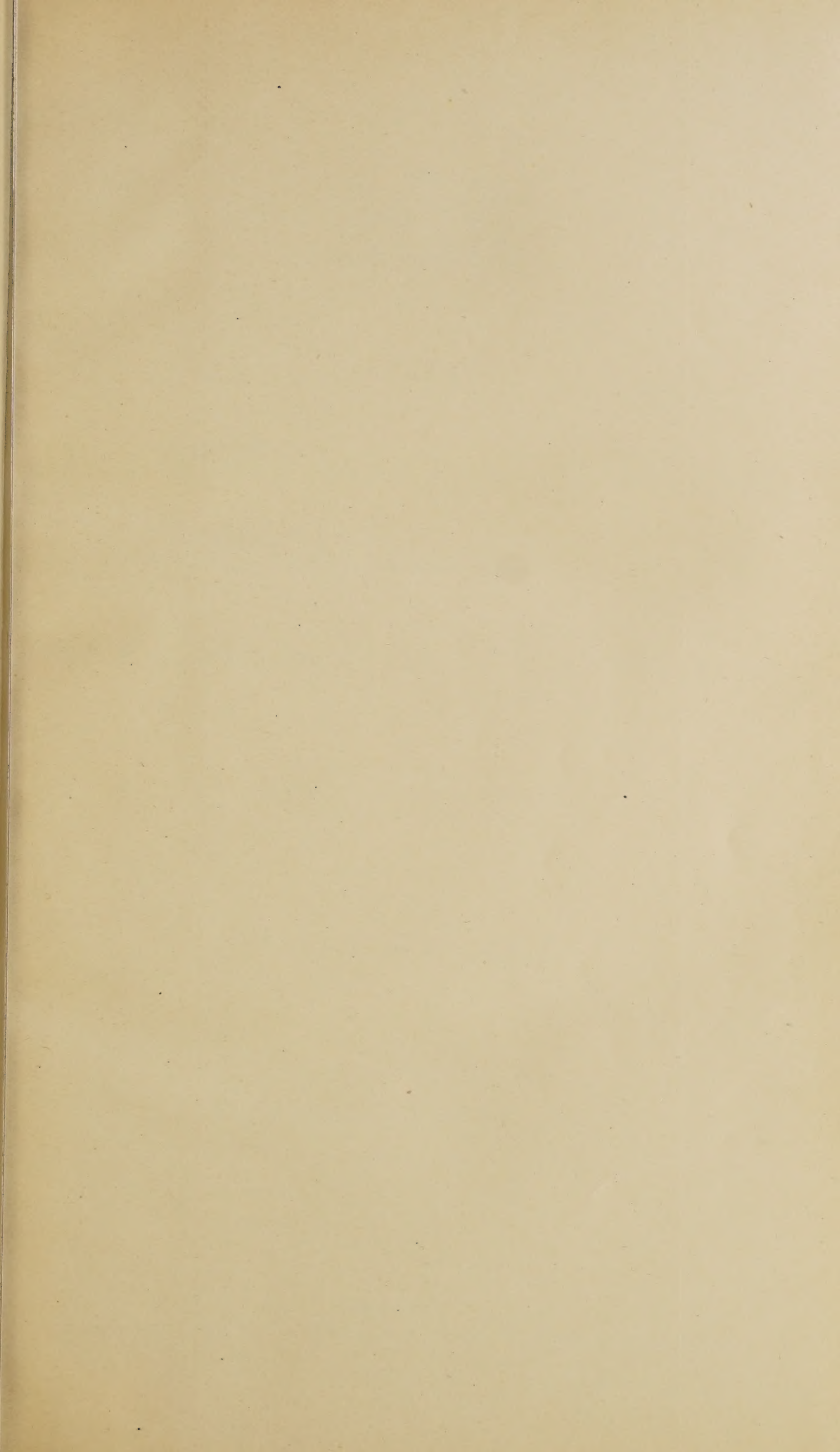
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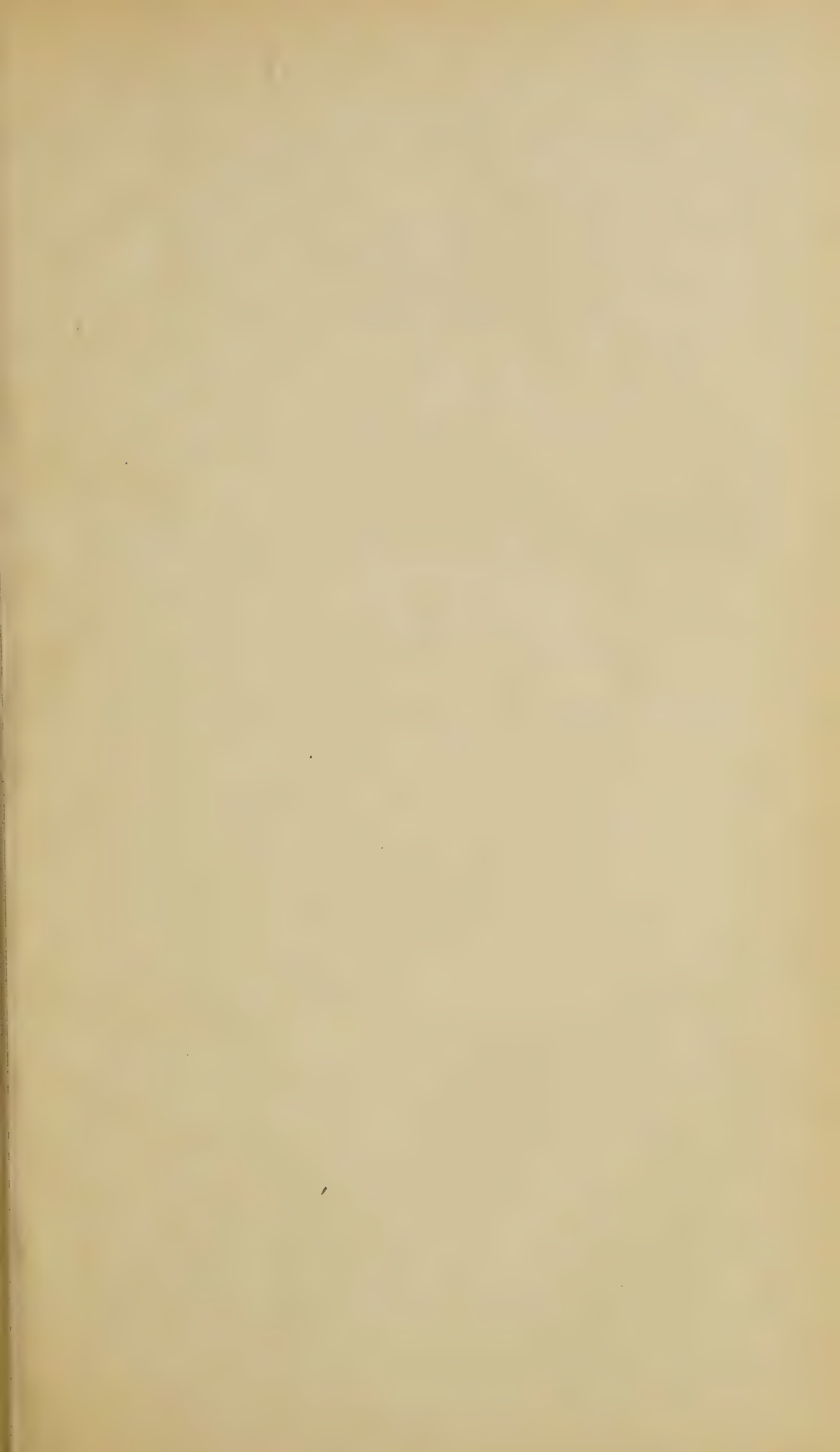
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Agriculture.

JOHN CHINAMAN, GARDENER.

It goes without saying that the European market gardener who understands his business, and devotes himself earnestly to it, can raise a greater variety of vegetables, and of infinitely better quality, than the Chinaman gardener. It was out of market gardening that Kubelik, the great violinist, made the money which enabled him to become a celebrated artist, and an exceedingly wealthy man. Why is it that we so rarely see a purely white man's market garden? We give it up. Vegetables grow to perfection all the year round in Queensland. The soil is unsurpassed in the world. Water is plentiful, or can be made so, yet the white farmer contents himself with a possible profit of less than £2 per acre on wheat, and proportionately small profits on maize, pumpkins, potatoes, &c., whilst the Chinaman forces ten times that amount per annum out of a small hand-worked vegetable garden.

His methods are described as follows by a writer in the "Rural Californian":—

For the past three years it has been my pleasure and privilege to observe the methods of a Chinese gardener near by, and humbly imitate his procedures in my own modest "truck patch."

Although in his own country "John" was a water-carrier by occupation, he has during his few years' sojourn here acquired a store of agricultural lore calculated to inspire his neighbours with envious admiration.

For example, when his young lettuce reaches the height of 2 or 3 inches, he does not eat or throw away the young plants in the process of thinning. Instead, he clips off about an inch of the root tip, and replants them in long rows, placing the plants at least a foot apart. This transplanted lettuce forms heads of such an immense size that at a short distance the bed resembles a cabbage patch.

His onions, which he always grows from the seed, disdaining the use of cloves or sets, have their roots clipped when transplanted, and grow to be larger than an ordinary saucer in an incredibly short time. He transplants beets in precisely the same manner as the lettuce and onions.

When he cuts off the lettuce heads for market he waters and cultivates the bare stalk, which heads out again in about one-third the time required to grow it from the seed. He treats his cabbages in the same way, except that he allows the outside leaves to remain attached to the stalk. The second head is small, and has no white centre, but he finds a ready market for it among the lovers of boiled greens.

"John" saves his pumpkins and squash seeds by leaving them inside the pumpkin or squash, as the case may be, until the planting season. Then he opens the aforementioned vegetables, and plants the seeds with the fresh pulp clinging to them.

He wraps his muskmelon seed in a tow sack and buries them in rich soil, keeping them very moist during the few days which pass before the seeds sprout. He then plants them, and they appear above the ground with mushroom-like rapidity.

Once, contrary to his advice, I set tomato plants on a spot where ashes had been thrown for several years. The vines grew to an enormous size, and had many blossoms, which dropped off in a few days. One day "John"

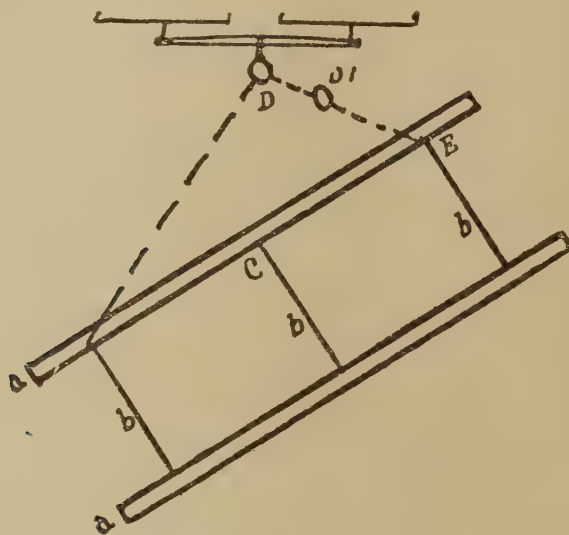
observed this, and with great solemnity came over and cut and hacked the branches of the plants almost half in two. Although this was in the latter part of July, the drooping, half-severed vines were soon loaded with tomatoes, and continued to bear until killed by frost in December.

GOOD ROADS.

We have from time to time published several excellent articles by the Hon. A. J. Thynne, M.L.C., on the subject of road-making, but rural authorities still adhere to the old practice of cleaning out the water-tables and heaping up a mass of grass, weeds, and mud in the centre of the road, in some cases putting on a blinding of gravel mixed with large stones. The roads beyond Mount Gravatt are excellent examples of this style of work. Such a road quickly degenerates into deep water- and wheel- worn ruts, but as these are never filled in till the road becomes almost impassable, it might just as well have been left alone.

Few of our country roads are macadamised—probably 90 per cent. are mere dirt roads. Can these dirt roads be rendered permanently sound? A United States farmer, Mr. D. Ward King, shows us how this can be effected for a mere song, by means of the log drag, which is described as follows:—

Following is a diagram of the drag with an explanation:



In this diagram *a, a*, are the two halves of a split log 9 feet long, 10 to 12 inches thick, set on edge, 30 inches apart, both flat sides to the front; *b, b*, strong oak or hedge bars, the ends of which are wedged in 2-inch auger-holes bored through the slabs; dotted line, chains or strong wire. *D, D1*, are rings to connect double-tree clevis. Hitch at *D* and stand at *C*, on a plank laid on the cross-bars, for ordinary work; or hitch at *D1* and stand at *E* for ditch-cleaning or to make the drag throw more dirt to the left. To move dirt to the right reverse position of driver and hitch. If working a clay or gumbo road, put iron, old wagon-tire, or something of the sort, on lower edge of drag at end of six months; for softer soil at the end of twelve months.

Relating his first experiment, Mr. King said:—

The horses were attached at such a point of the wire as to give the drag a slant of about 45 degrees in the direction required to force the earth that it would gather from the side of the road up into the centre. We had just had a soaking rain, and the earth was in a plastic condition. I had driven this drag but a few rods when I was fully aware that it was serving at least the initial purpose for which it was intended—that of levelling down the wheel rut and pushing the surplus dirt into the centre of the road.

At my neighbour's gate, towards town, I turned around and took the other side of the road back to my home. The result was simply astonishing. More rain fell upon this road, but it "ran off like water from a duck's back." From that time forward, after every rain or wet spell, I dragged the half-mile of the road covered by my original experiment.

At the end of three months the road was better than when it had been dragged for three weeks, and at the end of three years it was immensely improved over its condition at the end of the first year's work. I studied the result of each step in my experiment, and finally learned that three elements are required to make a perfect earth road, and that the lack of any one of them is fatal to the result. To be perfect an earth road must be at one and the same time oval, hard and smooth. All of these indispensables are acquired by the use of the split-log drag in any soil that I have ever come in contact with—and I have worked in the various kinds of clay soil in the gumbo of the swampy lowlands and in the black mud of the prairies.

Observation of my experiment taught me that two weeks of rain would not put this bit of road in bad condition at a time when the highway at either end of it was impassable for a wagon. Of course, it was plain that the reason the road was not bad was that there was no mud in it. But why mud would not collect in it was not clear to me until I was taught my lesson by the very humble means of the hog wallow. One day I chanced to notice that water was standing in one of these wallows long after the ground all about it had become dry. Probably I had many times before observed this fact, but not until now had it occurred to me to inquire into its cause. Examining the edges of the wallow, I was impressed with the fact that it was almost as hard as a piece of earthenware. Clearly this was because the wallowing of the hogs had mixed or "puddled" the earth and the water together, forming a kind of cement, which dried into a hard and practically waterproof surface.

The next important lesson in my understanding of the real elements of road-making was taught me by studying what we farmers call a "spouty spot" in the side of a clay hill. All who live in a clay country know the unspeakable stickiness of one of these spouty places, and are familiar with the fact that, after ten days or two weeks of bright, hot sunshine, you can take an axe and break from one of these spots a clod so hard that with it you can almost drive a ten-penny nail into a pine plank. Naturally, it occurred to me that, if this puddled clay soil would stay hard for three months when left in a rough condition, it would surely stay longer if moulded into the form of a smooth roof, so that the water which fell upon it would easily run off.

This original half-mile of road was dragged steadily for four years before I had a single active recruit in my new crusade. At first my neighbours poked good-natured fun at me, probably because the thing was so new and so absurdly simple—and, perhaps, also, because I did the work without pay or any expectation of it. Road-making in the country, it may be well to explain, is not generally followed as a fashionable philanthropy or a popular diversion.

From the outset of this work, so many questions have poured in upon me indicating points concerning which the public is prone to go astray in its understanding of how to build and use the split-log drag, that I have prepared the following road-dragging "catechism" as covering, with fair completeness, the main working facts in the problem:—

Would it not be better to plough the road before dragging? No. Ploughing gives a soft foundation. Ploughing the middle of the road is a relic of the old dump-scraper days.

What do you do when there are deep ruts in the road? Drag them. If you drag when the surface is quite loose and soft, you will be surprised how soon the ruts disappear.

How do you get the dirt to the middle of the road? By hauling the drag slantwise with the end that is toward the centre of the road a little to the rear of the other end.

But suppose the road is too narrow? First drag the wheel tracks. After three or four rains or wet spells, plough a shallow furrow just outside the dragged part. Spread this over the road with a drag. Only plough one furrow. You may plough another furrow after the next rain. At each ploughing you widen the road bed 2 feet.

How many horses do you use? Two, generally; three if it is just as handy; four when breaking colts—a good solid team in the centre and a colt on each side; two men on the drag—one to drive, the other to control the colts.

How do you drain the road? If the earth is pushed in the middle of the road continually, the road will drain itself.

Why not make the drag out of plank? You can, and do good work. But the split log is best. The plank drag is not so stiff.

Why not make the drag of heavy sawn timber? Because drags so made have a tendency to slip over the bumps.

Don't you grade up the road first? No. The grading is done with the drag gradually. By so doing, the road is solid all the time, and is built on a solid foundation.

What does it cost to drag a mile of road a year? The cost is variously estimated at from one to three dollars.

How do you keep the drag from dodging around sidewise? By not loading it too heavily. If a drag dodges around the earth you are moving, it is because it is overloaded.

Will the dragged road stand heavy hauling? Yes and no. A dragged road will stand more heavy hauling than an undragged road, but not so much as a macadamised or well-kept gravel road.

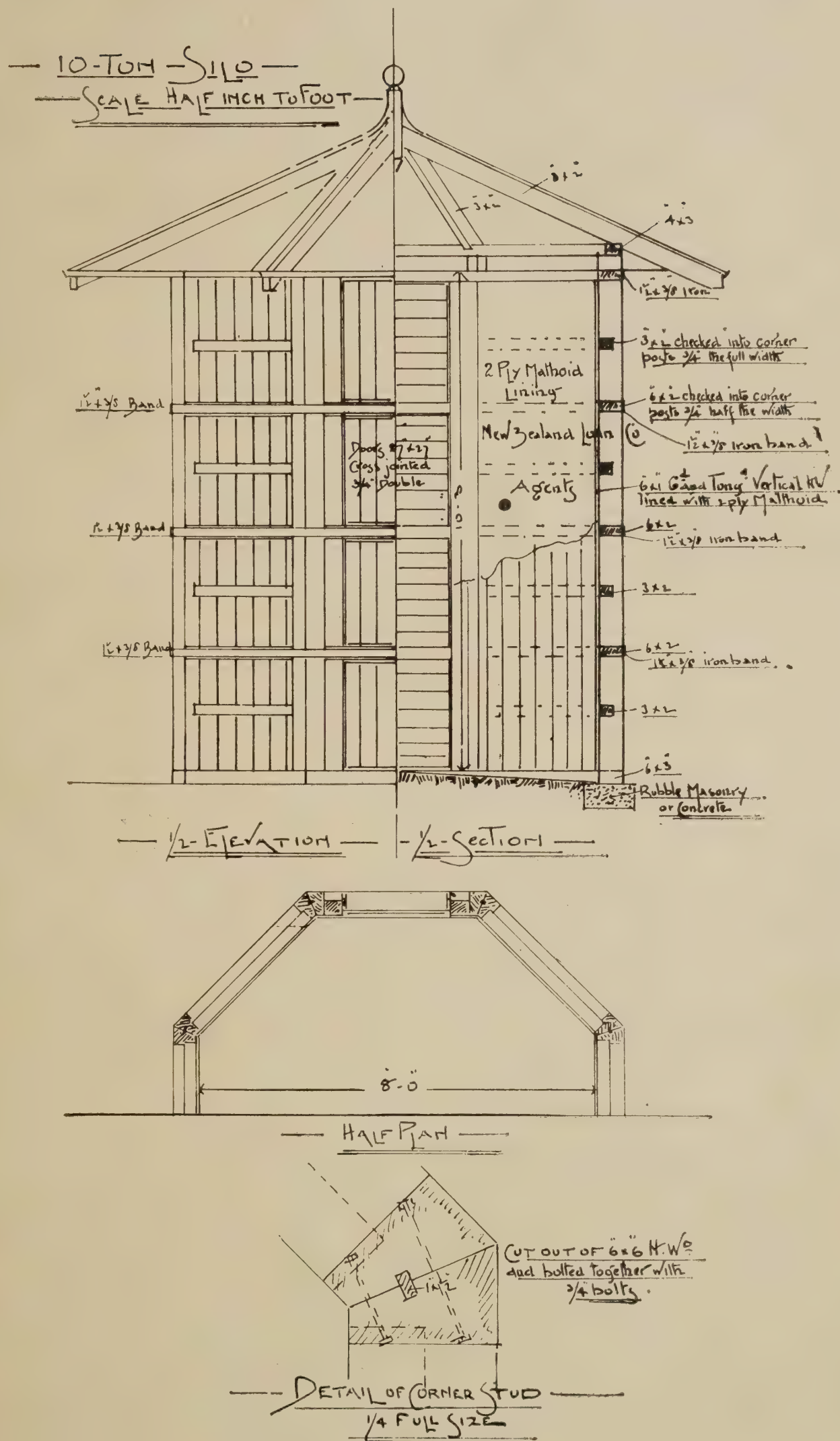
Will a drag help a sand road? A sand road is a very different proposition from the black soil, clay, or gumbo. An entirely different method must be adopted. Three things may be done to a sand road to make it better: First, keep it wet; second, haul clay on to it; third, sprinkle it with crude oil, as they do in California and in some parts of Southern Kansas and Texas. The drag will be beneficial in keeping the sand road perfectly flat, so that it will absorb moisture and retain it a long time.

To this catechism I would add the following "Don'ts": Don't drive too fast. Don't walk; get on the drag and ride. Don't be particular about material; almost any log will do. Don't try to drag with only one piece; use two.

A 10-TON SILO.

In response to the request of a Gladstone farmer, we here describe and illustrate a cheap silo, having a capacity of 10 tons, which can be erected at an approximate cost of from £25 to £30. The plan was prepared by Mr. A. Morry, who has already given plans, details, and estimates of silos of larger dimensions in late issues of the Journal, and from these the details of the small silo may be worked out. By using malthoid lining, there is no occasion at first for an acid-proof dressing, as the material itself is treated in process of manufacture with an acid-proof substance. Later on, it would be an advantage to dress the malthoid lining with a composition obtainable from the agents, the New Zealand Loan and Mercantile Agency Company, Brisbane. The Agricultural Department has used carbon-elastic paint for dressing galvanised iron to prevent the action of acids and weather, but it has not yet had an exhaustive trial, so nothing definite can be given.

Plate I.



UTILISING ALKALI PATCHES.

In some parts of the State there are, in the midst of the rich fertile black soil lands, patches of alkali soil, on which it was once believed that nothing would thrive. Such isolated areas existed on lands near Warwick, and the manager of the State farm, the Hermitage—then Mr. Chas. Ross, now managing Westbrook State Farm—set to work to remedy the evil. His experiments met with complete success, and yet the remedy was so simple that it is remarkable nobody had thought of it before. He knew that there were certain plants which could absorb a large amount of alkali, and especially amongst them he included mangolds and the silver beet. These grew to perfection on the alkali patches, and removed so much of the salt that in time the land was rendered fit for wheat, lucerne, and other grasses. Lucerne, it was found, also thrives on the alkali after mangolds, or at once, provided the surface be fairly free from alkali. Under such conditions the seed germinated, and the roots made their way to a considerable depth below the alkali strata, and thence drew ample nourishment for the plant. On the other hand, whilst magnificent cabbages, cauliflowers, and other vegetables were grown on the farm, they were a failure on the alkaline spots, as were all other legumes. It is said that asparagus will do well on such land, being alkali-resistant. This plant was, we believe, not experimented with.

GROUND LIME *VERSUS* GROUND LIMESTONE.

In recent years the once common practice of applying heavy dressings of quicklime to the soil has fallen into disuse. The idea underlying that practice was to make provision against "lime-hunger" for a good many years. But if there be one thing which has been more clearly proved than another by the agricultural experiments of recent years, it is the fact that heavy dressings of quicklime were unprofitable. For one thing, the quicklime, when applied in large quantities, killed off a large proportion of the nitrifying and other advantageous soil bacteria. For another thing, lime sinks rapidly in the soil, and through the action of rain water it is carried into the drains or the subsoil, so that, as a rule, it is soon beyond the reach of the plants. In recent years the much more rational plan of applying small dressings of ground quicklime has been introduced, and has generally given very satisfactory results, particularly in soils which were rich in organic matter. This ground quicklime was applied in dressings of up to 20 cwt. per acre, and this small quantity was readily utilised by the soil bacteria for the use of the growing crop. Lime is an essential element of plant food, and every crop grown on any soil removes more or less lime from that soil. In the case of soils infected with the germ of the finger-and-toe disease, the ground quicklime, which can be very equally distributed over the soil, may be used to kill these malign germs, and induce a healthy growth of crop, particularly when the lime is buttressed with potash, and no acid manures are used in dressing the soil. It is a curious fact, however, that quicklime, whether ground or in the "shell" form, is produced from limestone—a hard rock in which the carbon dioxide of composition is driven off by burning, and that the quicklime, on being exposed to the air, absorbs this same gas, and is again converted to carbonate of lime. These facts have raised the question as to whether the ground limestone rock might not be ground to a fine state of division and applied to the soil just as quicklime is. This question has been dealt with experimentally by the staff of the Lancashire County Council, who have issued a report of experiments on the subject by Mr. Edward Porter, B.Sc., and Mr. R. C. Gaut, B.Sc. The report states that quicklime in the "shell" form and also in the form of ground

lime were tested against limestone which had been ground to a fine state of division. Quicklime, on reabsorbing the carbon dioxide and reverting to the carbonate form, increases greatly in bulk, so that 1 ton of it will weigh when completely converted into carbonate of lime, $1\frac{3}{4}$ ton. One ton of "shell" lime, therefore, was tested against 1 ton of ground lime, and also against $1\frac{3}{4}$ ton of ground limestone, while a "no-lime" plot was kept for "control" purposes. These tests were carried out on four different farms, and the results were singularly uniform, the balance being decidedly in favour of ground lime as compared with shell lime, and rather decidedly also in favour of the $1\frac{3}{4}$ ton of ground limestone as against the 1 ton of ground lime. The difference in price was also in favour of the ground limestone, as the 1 ton of "shell" lime cost 14s. 2d., the 1 ton of ground lime cost 22s. 2d., while the $1\frac{3}{4}$ ton of ground limestone only cost 13s. 8d. Alike, as regards both price and produce, therefore, the balance was in favour of the ground limestone, which has the further advantage that it has no irritating effects on the eyes and the nose, and drops to the ground more readily than ground lime from a mechanical sower. If these results are confirmed by further experiments on a large scale, it seems more than likely that the use of limestone ground to a fine powder will make rapid headway in the favour of agriculturists.—"Agricultural Gazette," Tasmania.

PRICKLY PEAR AS FOOD FOR STOCK.

The importance of the question, How to deal with the prickly pear in Queensland? cannot be over-estimated. Already large sums have been expended by the Department of Agriculture and Stock, as well as by private land-owners, in the endeavour to eradicate the pest, but without avail. Still, considerable areas of prickly pear infested land have been taken up by selectors, and are gradually being brought under cultivation or turned into useful pasture land. By the courtesy of Mr. Sydney Dodd, Chief Veterinary Surgeon and Bacteriologist to the Department, we have been furnished with a pamphlet issued by the United States Department of Agriculture (Bureau of Plant Industry, Bulletin No. 74), a perusal of which would lead to the conclusion that by a certain method of treatment the pear may prove to be a blessing instead of the reverse in the semi-arid districts of the State. This pamphlet has reached us too late to enable us to give more than a general outline of its features in this issue of the Journal, but next month we shall make copious extracts, accompanied by several illustrations, showing the methods of treatment by which the plant is turned to good account as a food for stock. Were it not for the formidable prickles with which the leaves and joints bristle, there would to-day probably not be a single plant on our Western lands. During the great drought which terminated in 1902, the starving stock would have lived upon it, obtaining fodder and drink which would have saved thousands of the cattle which then died of starvation. Indeed, many were saved by being fed with the pear when steamed, but this was a too laborious and expensive business to be generally adopted.

SINGEING THE SPINES.

For the greatest progress in this line, we must see what has been done in Texas, U.S.A., and also in Mexico. There the plants were, and are to-day, collected and hauled to some convenient place, where a fire is built. The fire quickly destroys the spines, leaving a succulent fodder, which cattle devour with impunity. This is the most primitive method of utilising the plant.

SINGEING WITH A TORCH.

A vast improvement on the above plan was that of singeing with a torch for removing the spines. The process consists in passing a hot-blast flame

over the surface of the plant, which can be quickly done, at small expense, since the spines are dry and inflammable, and the more spines the better they burn, and even the application of a match to the lower part of the trunk will destroy them. The instrument used for the purpose is a modified plumber's torch. Any other convenient torch which gives a good flame can be employed, and the innermost parts of the plant can be reached by the flame.

These pear-burners were first manufactured in 1898. They consist of a strong metal tank supported on the shoulders of the operator by a strap, a long delivery pipe, and a burner for generating and consuming gas from gasoline. The distinguishing features of one of the pear-burners on the market are the turning joints of the delivery pipe and the simple coiled-pipe burner, which is covered with a sheet-iron cylinder to prevent the escape of heat, to give direction to the flame, and to protect the burner in windy weather.

The other style of burner differs from the one just described mainly in the burner, which is somewhat more complicated. The generated gas in this machine passes through a chamber filled with a bundle of fine brass wires before being ignited. It also has some safety arrangements for ensuring the heating of the oil, and consequent generation of gas, which are claimed to have merit.

Both machines require gasoline for their operation, and are handled to best advantage with a good quality of oil, and in weather free from wind.

Practically no labour is necessary with the burners other than that of passing the blast flame from the torch over the surface of the joints momentarily. Indeed, it is not usually necessary to do this with over two-thirds of the plant, for there is, commonly, enough dead herbage at the base and growing up through the pear plants to assist in burning off at least one-half of the spines. This is the cheapest method yet devised for utilising the prickly pear. It has, however, one or two disadvantages. There is a prejudice—whether well founded or not, it has been impossible to determine—against pear scorched to the extent necessary to ensure the destruction of all the small spines. It is claimed that cattle scour much worse upon pear which has been excessively scorched by either torch or brush flame. Another objection urged is that torch-scorched pear invariably dies if the flame is kept upon it long enough to ensure the removal of all the spines. This is really an important matter for those who have little pear in their pastures, as simply singeing off the larger spines does not check the growth of the plant at all, and all the singed plants not actually grazed grow the following season.

[The dying off of torch-singed plants would certainly be no objection to the process in Queensland.—Ed. "Q.A.J."]

Burning with a pear-burner will kill out the pear entirely if close pasturing is practised afterwards.

We shall, in the next issue of the Journal, deal more extensively with the subject of the destruction of the pear by means of the torch apparatus, and with the value of the plant as a fodder for stock.

So much importance is attached to the prickly pear in Texas that some cattle-owners actually plant the cactus instead of destroying it, and it is there held that the occasion for the destruction of the pear does not exist, and that an absolute destruction would be a calamity indeed.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

RECORD OF COWS FOR MONTH OF MAY, 1908.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Rhoda ...	Grade-Shorthorn	30 Mar., 1908	819	3·7	33·93	
2	Hettie ...	" "	26 Mar. "	660	4·2	31·04	
3	Winnie ...	Shorthorn	15 April "	737	3·7	30·54	
4	Carrie ...	Jersey ...	4 April "	643	3·8	27·36	
5	Glen ...	Shorthorn	10 Feb. "	551	4·1	25·30	
6	Mona ...	Grade-Holstein	26 Oct., 1907	475	4·5	23·94	
7	Nancy ..	Shorthorn	7 May, 1908	517	3·9	22·58	First calf.
8	Damsel ...	Holstein ...	19 Feb. "	588	3·3	21·73	
9	Cuckoo ...	Jersey ...	4 Mar. "	444	4·3	21·38	
10	Nellie II. ...	Shorthorn	26 Dec., 1907	454	3·8	19·32	
11	Cocoa ...	Jersey ...	20 Nov. "	380	4·5	19·15	
12	Ivy ...	"	5 Feb., 1908	362	4·6	18·65	
13	Laura ...	Ayrshire	20 May, 1907	384	4·3	18·49	
14	Beauty ...	"	21 Dec. "	485	3·4	18·46	
15	Lucy II. ...	Shorthorn	1 May, 1908	456	3·5	17·87	
16	Comet ...	Grade Holstein	23 Aug., 1907	307	5·2	17·87	
17	Careless ...	Jersey	29 Oct. "	315	5·0	17·64	
18	Clare ...	"	21 Aug. "	289	5·4	17·47	
19	College Lass	Ayrshire...	1 Sept. "	329	4·7	17·31	
20	Honeycomb	Shorthorn	23 Aug. "	327	4·7	17·21	
21	No. 112 ...	Grade Jersey	23 Aug. "	356	4·3	17·14	
22	Lily... ..	Ayrshire	2 May, 1908	476	3·3	17·59	
23	Dot... ..	Shorthorn	20 Aug., 1907	329	4·5	16·58	
24	Graceful ...	"	11 Jan., 1908	299	4·8	16·06	

ADVANTAGES AND DISADVANTAGES OF GRADING CREAM.

The following paper, which was read by a farmer before a Manitoba (Canada) Dairy Association, will no doubt be read with interest by dairy farmers and factory managers, seeing that it touches points which have already received attention by them in Queensland:—

ADVANTAGES AND DISADVANTAGES OF GRADING CREAM.

(Paper read before the Convention of the Manitoba Dairy Association by Geo. Mattheson, Shellmouth, Manitoba.)

The subject of grading cream has been more discussed during the past few years. Some years since it was put upon trial by one of the larger creameries in the American West with signal success. Since that time the system has spread—slowly, it is true—and at the present time the subject is a live one. It is discussed wherever creamery men meet, and has been the medium of proposed reform by the dairy departments of more than one State. The compulsory use of cream-grading has even been hinted at.

Cream-grading has, of course, its advantages and disadvantages. I shall enumerate a few of them. The advantages—first, the cream producer is paid according to the quality of his cream, or, if you like, according to the quality of the intelligence and of the labour which he puts into the task of cream-producing. Is it not fair that the man who takes good care of his cows, milks them in a cleanly manner, separates the milk in the right way and at the

proper time, and, lastly, cools the cream immediately, and keeps it cool until it is delivered to the creamery, is it not just and equitable that such a man should receive a better price than his neighbour who is careless, heedless, and negligent? Which of them is of the greater value to the creamery? Is not the former taking a part, however small or insignificant, in improving the dairy products of his province, and may it not be said that he is a better citizen? The dairyman ought to receive pay according to the quality of his labour.

It may also be said that grading cream will enable the butter-maker to turn out a higher average grade of butter, commanding a better price. In every line of endeavour the best sells for the highest, and the poorest for the lowest price, and this is true whether this article in question is grain, live stock, or produce. We have been told time and again that the quality of our butter is far from what might be desired, what the faults are and how they can be remedied; but unless there is some monetary inducement offered to the producer of cream, I do not know that we are likely to make much headway. What someone has called the campaign of "please be clean" is a discouraging and almost hopeless task, and I do not think will avail much unless it can be shown that the result will eventuate in dollars and cents to the man behind the cow.

Grading cream gives the creamery a chance to build up a reputation (which ought to have a money value) for good butter, because the creamery which buys and pays for grade will receive more good cream than the creamery which pays the same for all cream. An increased over-run is impossible, especially if rich cream is insisted upon, and if the creamery work is done according to the best standard.

The disadvantages lie in the extra work which a cream-grading system will entail upon the cream operator, in carrying out the testing for grade, caring for cream, in a double number of vats, extra work in cleaning, and in bookkeeping. It is necessary to test each delivery of cream separately; and, to be properly done, a report of the condition of his cream should be sent to each patron, together with suggestions for improvement. It is easily seen that in a small creamery, where one man does all the work, the extra work involved, where 60 to 100 separate patrons' cream is dealt with, will be considerable. There is the difficulty in fixing a dividing line between the grades that shall be most generally satisfactory. Bad roads form another complication, as well as the long distances cream has to be hauled. We find it also difficult to convince the patron that the grading is done in an honest and impartial manner. Especially is this so in the case of many patrons of foreign nationality. Grading may be done best where individual cans are used in which to deliver the cream.

These are some of the advantages and disadvantages in grading cream. It remains for us to consider whether it is practicable for the local creamery (say, an average summer plant making 40,000 to 60,000 lb. of butter) to grade the cream delivered to it. The local creamery is in a somewhat different position than a centralised plant as regards cream-grading. This is particularly the case when we consider the sparse rural population in many parts of Manitoba. Cream has to be hauled, in many cases, as far as 20 miles. A creamery of this size may have as many as eight cream routes. The cost of collecting the cream in an average year may be $1\frac{1}{2}$ cents to $1\frac{3}{4}$ cents per lb. In a poor season like the last it may come as high as $2\frac{1}{2}$ cents. In the face of these facts, and in the presence of competition, the local creamery may well hesitate and ask, "Shall we, by grading, receive a larger percentage of good cream than otherwise, and will we be able to turn out a quantity of butter of such improved quality as will compensate for the premium paid for No. 1 cream, and leave such a profit as will sufficiently reward the extra labour expended?" An alternative course presents itself to the creamery having quality in view, and that is, to accept only good

cream, and refuse the bad. Here we are met by the same objections—there is a possibility of losing patrons, and thus increasing the cost of making. Personally, I think that the taking of any but good cream is the poorest kind of business, and that the creamery whose motto is, "Good cream or none," will best succeed. Were it not better to apply the energy used in making up poor cream to seeking a better market for our good butter?

During the past season we at Shellmouth have practised grading. The cream was delivered to the creamery by haulers. The cream was collected twice a week on four routes, and once only on other four. Individual cans are used. The hauler simply brings the cream—the weighing and stamping is done by the butter-maker. We did not seek to impose an impossible standard. We did not insist that the cream should be sweet for No. 1 grade. That would be well nigh impossible. If it was mildly sour, of good flavour, and would run freely through a fine wire strainer of 70 holes to the inch, provided it tested 30 per cent. fat, it was No. 1. That is not a severe standard. Any farmer who has a good separator can produce 30 per cent. cream, and keep it for three to five days in condition to grade No. 1 under the test I have mentioned. This insistence upon 30 per cent. fat for No. 1 grade caused a good deal of criticism, and some dissatisfaction in some quarters. It is hard for the average farmer to realise the importance of skimming a heavier cream—over 30 per cent.—and the benefits accruing to himself thereby. During the past season the proportion of No. 2 grade testing over 30 per cent., was only 3 per cent. We received 36 per cent. No. 1 grade.

If cream-grading is to be used as a method of improving the cream receipts, some kind of grade-card is desirable. Such a card should have the patron's name, date, and pounds of cream delivered, grade also, and the fat test, if the card is to be mailed. The card might have printed upon it, in separate numbered paragraphs, the common faults of cream, and the remedies to be applied. A space can be left for additional card, which would also form a receipt to the patron for his delivery of cream. The sooner the patron knows how many pounds of cream he is credited with, and what his grade and test is, the better will he be satisfied.

These are a few first year's experiences in grading cream. It is, perhaps, too soon to say whether it is an entire success or not. We may lose a few patrons but I think not. If we do, they are knockers, and the creamery is better without them. I believe the result is, on the whole, encouraging. We are up against a great deal of helpless (almost hopeless) ignorance on the part of many patrons. Grading cream is not a panacea for all the ills that the creamery business is heir to. It is, however, an advance step in an effort to make better butter, and more of it. By its use, and by "patient continuance in well-doing," it will have its reward.—"N. W. Farmer."

FEEDING WHILE MILKING.

Most farmers claim that cows will stand quieter and let down their milk more freely if they are given something to eat while they are being milked. But those who have adopted the plan of milking before feeding are seldom, if ever, anxious to go back to the old method of giving the cows something to eat while they are being milked. Few cows seem to be able to divide their attention between the two operations. When the cow has nothing to attract her attention she stands quietly when she sees the milker approach. She also lets down her milk more freely than when she is attempting to eat at the same time. The cow that has her head in the manger seldom sees her milker approaching, and the first intimation she has of his presence is when

she feels the milking-stool against her flanks. If she has a nervous disposition, which is the case with most good dairy cows, she will either jump or kick, and then continue to annoy her milker by switching her tail until he has finished milking.

If the cow is fed at the same time that she is being milked, she is in so great a hurry to get her feed that she becomes restless, and will not give down her milk freely. To make a change from the old practice of milking the cows while they are eating, to feeding them after they have been milked, will probably cause much restlessness on the part of the cows, but as soon as they become accustomed to it, which will not take long, they are much quieter than where both operations are conducted at the same time.

Not only is it pleasanter to milk before the cows are fed, on account of their better behaviour, but from a sanitary standpoint the keeping qualities of the milk are much better when the feeding is done just after milking. Dry feeds contain a large quantity of dust, which is thrown into the air by handling and is generally very heavily laden with bacteria. As the dust settles into the milk pail, it carries with it thousands of these bacteria. In addition to this, the restlessness of the cows, resulting from being milked while eating, dislodges dust from themselves as well as from their milker, which, laden with bacteria, falls into the milk.—“N.Z. Town and Country.”

MILK AND BUTTER COMPETITION, ROCKHAMPTON AGRICULTURAL SHOW, 1908.

The following details, given by a local journal, of the Milk and Butter Competition at the Rockhampton Agricultural Society's Show this year, have been forwarded to us by Mr. H. T. Deighton, dairy inspector:—

A milk and butter competition was held again this year by the Rockhampton Agricultural Society in connection with its annual show. Only five thought it worth while to enter; but they put in nine cows. The prizes on this occasion, as in 1907, were £10 10s., £5 5s., and £2 2s., and the competition, like that of the one preceding it, was carried out on the farms. That is to say, the cows were milked at home, and not, as was the case prior to 1907, on the grounds—in the same bails as they go to every morning and evening, and by the men who ordinarily look after them—a representative of the society attending the day before to see them milked dry, attending the test milkings, weighing the milk obtained at each milking, and taking samples of the milk each time for the purpose of ascertaining the percentages of butter fat. The prizes, of course, as is usual in such contests, went to the three cows that revealed the greatest merit with respect to the weight of milk, the quantity of butter fat, and the ratio of milk to the pound of commercial butter—a point being awarded for every ten days since calving, deducting the first forty days, but with a maximum of 14 points; a point being given for every pound of milk produced at the two milkings; and 20 points being allowed for every pound of marketable butter indicated according to the Babcock milk tester, with a deduction of 10 points each time the proportion of butter fat was below 3 per cent. The conditions also provided that in the case of cows obtaining the same number of points, the advantage should be given to the one that had been longest in milk. The nine cows entered this year were milked last month in the presence of Mr. H. T. Deighton, the Government inspector of dairies for the Rockhampton district, and the tests for butter fat were also conducted by Mr. Deighton. The results of the competition were sealed by Mr. Deighton as soon as they were completed, and were opened yesterday by the president of the Agricultural

Society (Mr. R. S. Archer), and made available to the public. They placed the competing cows in the following order:—

J. M. Cooper's Rose, 12 years, Ayrshire, calved on the 9th of April, 1908	1
J. Edmystone's Fanny, 7 years, grade Ayrshire, calved on the 2nd of February, 1908	2
Goldsbrough, Mort, and Co.'s Lovely of Casuarina, 6 years, Ayrshire, calved on the 23rd of February, 1908	3
Archer Brothers' Lena, 10 years, Shorthorn-Jersey, calved on the 13th of January, 1908	4
J. Edmystone's Violet, 8 years, Jersey, calved on the 6th of April, 1908	5
J. Edmystone's Ruth, 6 years, Ayrshire, calved on the 3rd of September, 1907	6
S. Hoare's Brindle, 7 years, Ayrshire, calved on the 9th of April, 1908	7
Archer Brothers' Caroline, 10 years, Shorthorn, calved on the 3rd of March, 1908	8
Archer Brothers' Whiteback, 11 years, Shorthorn grade, calved on the 15th of April, 1908	9

The milk and cream records of the cows are as follow:—

	Weight of Morning Milk.	Weight of Evening Milk.	Percentage of Butter Fat in Morning.	Percentage of Butter Fat in Evening.	Commercial Butter in Morning.	Commercial Butter in Evening.	Total Commercial Butter.
	Lb.	Lb.			Lb.	Lb.	Lb.
Rose	20 $\frac{1}{4}$	17	4.2	4.6	0.95	0.87	1.82
Fanny	17 $\frac{1}{2}$	20	3.6	3.6	0.70	0.80	1.50
Lovely of Casuarina	19 $\frac{1}{4}$	19	3.4	4.0	0.70	0.84	1.54
Lena	16 $\frac{1}{2}$	11	5.0	5.2	0.91	0.63	1.55
Violet	20	17	3.4	3.4	0.75	0.63	1.38
Ruth	13 $\frac{1}{2}$	13	3.6	4.0	0.54	0.57	1.11
Brindle	18	16	3.8	3.2	0.75	0.56	1.31
Caroline	13 $\frac{1}{2}$	10	5.0	4.8	0.74	0.54	1.28
Whiteback	12 $\frac{1}{2}$	7 $\frac{1}{2}$	4.8	4.5	0.66	0.37	1.04

The points gained by each competitor are as follow:—

	Rose.	Fanny.	Lovely of Casuarina.	Lena.	Violet.	Ruth.	Brindle.	Caroline.	White-back.
Commercial butter	36.40	30.00	30.95	31.00	27.60	22.20	26.20	25.70	20.80
Quantity of milk ...	37.25	37.50	38.25	27.50	37.00	26.50	34.00	23.50	20.00
Points added for time in milk	...	5.70	4.00	7.20	...	14.00	...	2.30	...
Total ...	73.65	73.20	73.20	65.70	64.60	62.70	60.20	51.50	40.80

It will be noticed that Fanny and Lovely of Casuarina tied in the matter of points for second position; but, in accordance with the regulation, the second prize was given to Fanny, she having been in milk three weeks longer than Messrs. Goldsbrough, Mort, and Co.'s cow.

In conjunction with the milk and butter competition there was a dairy cows' competition—that is, for cows which give the greatest weight of milk in two milkings—the milkings in the milk and butter competition to be the milkings also in the dairy cows' event. The prizes in this instance were £2 2s. and £1 1s. Only seven cows were entered for this, and the result was as follows:—

Goldsbrough, Mort, and Co.'s Lovely of Casuarina, with a yield of 38 $\frac{1}{4}$ lb. of milk in the two milkings	1
J. M. Cooper's Rose, with 37 $\frac{1}{4}$ lb. of milk	2
J. Edmystone's Violet, with 37 lb. of milk	3
S. Hoare's Brindle, with 34 lb. of milk	4
Archer Brothers' Lena, with 27 $\frac{1}{2}$ lb. of milk	5
Archer Brothers' Caroline, with 23 $\frac{1}{2}$ lb. of milk	6
Archer Brothers' Whiteback, with 20 lb. of milk	7

The Horse.

MORE ABOUT THE SUFFOLK PUNCH.

Whether the Suffolk Punch will ever reach the position of the most favoured heavy horse is, perhaps, a matter of considerable doubt, but to those who require for their work a fast, active, good-tempered and good-constituted draught horse, there is no gainsaying the fact that they might do far worse for themselves than by giving a chance to the handsome and long-lived Suffolk Punch, whose antiquity alone may commend him to their consideration.

Even as a heavy saddle horse, the Suffolk is a treasure. The writer bought a beautiful, nuggetty, silver-maned chestnut Suffolk from Mr. White, of Bluff Downs, North Queensland, in 1875. A more powerful, docile horse for a traveller could not be imagined. Fast, he was not; but for endurance he could not be surpassed. The proof of this may be shown that, on one occasion, the writer left the late Mr. William Hann's station at Maryvale (N.Q.) at 6 a.m. to make a station only 40 miles distant. Mr. Hann gave directions for a short cut through the bush; but, as it turned out, "the longest way round would have been the shortest way home," for, after carefully following directions, nightfall found the traveller in a piece of waterless broken country, and during the whole day no water had been found. After a fruitless endeavour to track the footsteps of a shod horse on the bank of a dry gully, it was decided to leave the matter to the horse. He set off at a quick walk, which he never relaxed till 4 a.m. the next morning, when he brought up at the first water on Tara station, and then trotted gaily on to Maryvale, a journey of nearly 80 miles. At 8 a.m. he started again, this time in company with the mailman, and reached his destination at 6 p.m., making a journey of 120 miles with only a spell of about two hours, and he was as fresh as a daisy on arrival. Next day he was ridden 30 miles a day to the Etheridge, *via* Gilberton, and returned to Townsville, after three days' spell at Georgetown, as lively and in as good condition and temper as if he had only had a day's outing. That horse cost £25, and he was worth £50. Now, here is an account of this breed of horses which must convince anyone that the Suffolk Punch is the horse, *par excellence*, for the farmer, taken from a paper by Mr. A. Jaques,* of Lamerton, Alberta, Manitoba:—

Perhaps, in the eyes of the ordinary visitor to an agricultural show, there is no variety of the so-called heavy horse more attractive than the Suffolk. The breed, moreover, comes as somewhat of a novelty to many persons, for, in spite of the great claims possessed by the Suffolk upon the suffrages of the agriculturist and the townsman, it is still in East Anglia that his merits are most keenly appreciated, and, in fact, the farmers in that part of the country prefer the Suffolk to any other breed of heavy horse.

It is still, however, against the breed that the proportions of a Suffolk do not equal those of a Clydesdale or a Shire horse, many persons being thereby led away into a belief that the east country animals are proportionately weaker than the others; whereas those who are best acquainted with their merits entertain the opinion that, considering his height—16 hands 1 inch is the recognised limit of stature in connection with this breed—the Suffolk is quite as powerful an animal as any other breed of horse in existence.

* Mr. Jaques is a breeder and importer of these horses, and has in the past two years imported direct from England 17 Suffolk Punch horses and 30 Suffolk sheep.

Probably, therefore, if he were better known in Western Canada, the Suffolk would considerably increase the circle of his supporters; but, in the face of the patronage that is now being extended to both Clydesdales and Shires, the development of the Punch will be for a time retarded. Nevertheless, he is holding his ground in many other countries, and is being largely sought after by the Germans, Austrians, and Russians, to be used in their Government studs for the purpose of crossing and getting artillery horses. No doubt this horse has not the weight or power to draw through crowded streets heavy lorries and other such cumbersome vehicles when loaded to their utmost. Such duties lie far more within the province of the Clydesdale or the Shire: but, in front of a plough, with a good man behind it, a pair of Suffolks can get through a day's work that should amply satisfy the requirements of any reasonably-minded agriculturist. Then, too, for the lighter class of goods traffic in towns, the Suffolk is a very suitable horse; he is so much more active than the Clyde or Shire, in addition to being faster than either, that he can get through a day's work in a comparatively light wagon far better than they.

The precise origin of the Suffolk is, like that of most ancient breeds, enshrouded in obscurity; but, at the same time, the antiquity of this horse is absolutely beyond all question. So far back as the year 1720 allusions to the breed in the Ipswich Journal are so frequent as to render it certain that it was firmly established at that remote period. Indeed, it is asserted by some that the Suffolks were cultivated as a distinct breed 500 years ago, by crossing the old Norman horse with East Anglia mares; though, it must be observed, in justice to other breeds of less remote antiquity, that the proofs of such assertions are insufficient. Be this as it may, the fact remains that the Suffolks of the present days can boast of pedigrees that extend back as far as 1768, at which period there existed a notable but nameless stallion belonging to one Crisp, a resident of Ufford, near Woodbridge.

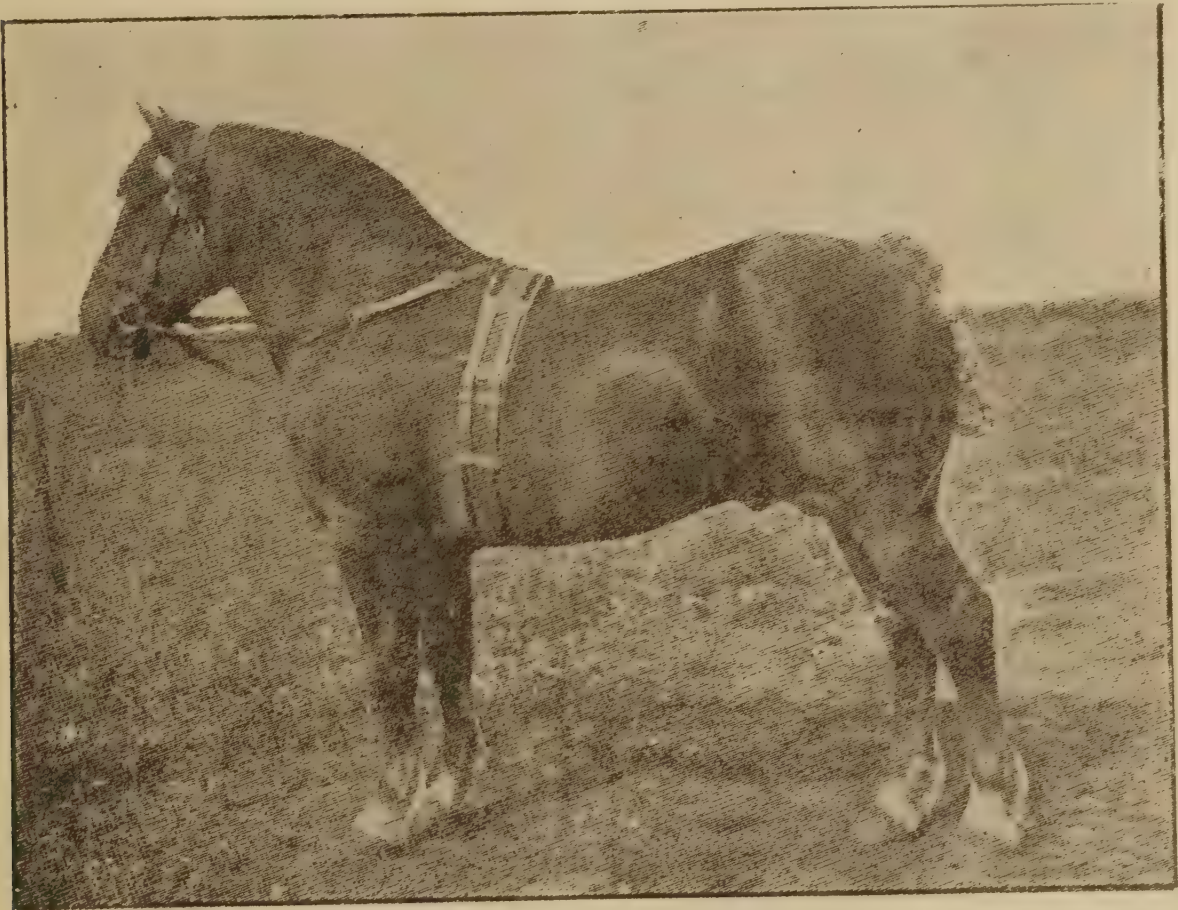
Of course, no colour of coat other than chestnut is admissible in an animal that is desired to enter for the Suffolk Stud Book Association, it being distinctly laid down that, though the shade may vary, there is no place for any horse save chestnuts in the Society's official volume.

In addition to colour, the Suffolk is distinguished from the Clydesdale and the Shire horse by the fact that he is a clean-legged animal, and does not possess the extreme amount of feather that is so much sought after by breeders of these varieties. This circumstance may very possibly be accepted as an additional reason for the slowness which has characterised the headway made by the Suffolk in Canada, for it seems that the majority of agriculturists in this country are great advocates of hair and bone, and a general belief prevails that if hair is absent on a heavy horse's legs, bone is certain to be deficient likewise. This, however, is not generally accepted by the breeders of Suffolks, who support their contentions by measurements, and assert that their favourite horse—that is, when his height at shoulder and general bulk are taken into consideration—is fully the equal of his heavier rivals as regards the amount of bone he possesses below the knee. As a case in point, Mr. Hume Webster refers to Mr. Alfred J. Smith's champion stallion Wedgwood, who, at the time he wrote, was five years old, and measured 7 feet 10 inches in girth and $10\frac{3}{4}$ inches below the knee—a very considerable measurement, when it is remembered that there is no hair included in the dimension given. Wedgwood, it may be stated, was foaled in the year 1886, and was the winner of championship at the show of the Royal Agricultural Society of England.

The Suffolk, moreover, is credited with a very enviable reputation for being a good horse so far as the soundness of his feet is concerned, and consequently it is claimed for him that he lasts longer upon the stones of a

town than any other variety that is put to the same class of work. Longevity, indeed, is one of the chief claims that Suffolk breeders insist upon making for their horses. As an instance, it is stated in the Society's stud book that at one of the exhibitions held by the Suffolk Agricultural Society, a brood mare, aged 37 years, was amongst the competitors, and at that time she was accompanied by a sucking foal. Julian's Boxer travelled as a stallion for twenty-five seasons. The dam of Lofft's Cupbearer, owned by the Rev. O. Reynolds, of Leabeach, was one of the sixteen foals which her owner had bred from her dam in sixteen years, and the mare from which Rising Star, the first prize horse at Leeds in 1861, was bred, was 22 years old when the colt was foaled. These are a few instances of the longevity and vitality of the Suffolk horse, and these could be multiplied many times were it necessary to do so, but enough has probably been written to convince the reader, if he were unacquainted with the fact before, that the breed now under consideration is a very remarkably long-lived and fruitful one.

The extreme docility of the breed is another great point in its favour, as it is something for an owner to feel that he possesses a strain of horses that rarely, if ever, develop vice; but, on the contrary, are usually endowed with the sweetest of tempers and generosity. That the Suffolk is a very willing horse is rendered quite apparent by a visit to any farm upon which he is employed. Unlike many chestnuts, too, the natural gameness of the Punches is not neutralised by hot-headedness or vice of any kind.



On the contrary, they are a somewhat phlegmatic dispositioned variety, though they possess an amount of courage which enables them to face and endure the hardest of work. Above all things, he is an agricultural horse; but, where pace and strength combined are required, as in the case of town work, he is equally at home. Beyond all question of doubt, he is the most nimble and active of all the so-called heavy varieties, whilst the Suffolk, for his size, is an extremely small feeder, and will flourish and look well upon an amount of food that would be totally insufficient for many other big horses.

The head of the Suffolk Punch shows more breeding and quality about it than that of any other heavy horse, a very conspicuous feature being the eye, which is full of expression, yet mild and intelligent-looking. The neck is powerful and well formed, and the crest beautifully turned. The head-piece is well carried; the shoulders, which are very long, lie rather forward, this being desirable for the purpose of draught. The chest is wide and deep, the girth of the middle-piece being very considerable, while the body, as a whole, is long and substantially built. The back is very strong, the hind-quarters long and heavy, and close coupled with the loin, the legs standing well under the body. The fore-legs—a very essential point, for however good an animal's top may be, he will be worthless if he has no legs and feet to carry him—must be short and flat, possessed of plenty of hard bone, big and free from feather, whilst the pasterns are short and powerful with little hair on them, the feet being of a good size and truly shaped. In general appearance, the Suffolk Punch is very happily ascribed as being long, low, and wide, and this summary of his outline cannot possibly be bettered:—

“The Suffolk is an excellent mover, with a smart, quick step, a true balance all round at the trot, and a magnificent walker.” As may be naturally supposed, an ultra-high flashy action is not desired, and it is naively added that “a horse weighing a ton, bending his knee up to his throat-latch, and striking the granite with his feet like a sledge-hammer, is not an exhibition that the Suffolk trader delights in.” In fact, a Suffolk that is heavy enough for the largest dray is seldom, if ever, called upon for an exhibition of speed and high action. Even if he is only up to ordinary van work, he is never likely to be wanted to go more than seven or eight miles an hour, and this class of animal will never scale a ton.

The Suffolk Punch is now being introduced for farm purposes by the Department of Agriculture and Stock, the first lot having been obtained from Mount Abundance, and we shall not be surprised to learn that before long the farming community will have appreciated the splendid qualities of the breed as active, enduring, docile animals, for the plough and the country wagon.

TO CURE A JIBBING HORSE.

The “Nor'-west Farmer” gives the following as a certain method of overcoming the jibbing habit of a horse:—“Whipping such a horse is generally of no use. Different horsemen have different ways of treating balky horses. One of the most successful ways of making a balky horse work is to hitch him to a tried and trusty animal that will pull up steadily but surely. Take a small stout cord—a small rope is good—and fix it with a noose around the tail of the balky horse after the fashion of a crupper. Pass the free end of the rope over the horse's back and tie it to the large hame rings of the other horse. Have the rope adjusted right as to length, and then start the old horse up quietly. Mr. Balky horse will perhaps lean back in his collar and not budge an inch, as was his usual custom. This will not continue long, however, for he will soon feel that noose tightening on his tail, and the more he pulls back the tighter the noose draws and the harder the rope pulls at his tail-head. It will take just about ten seconds, if the rope and noose are fixed properly, to convince any balky horse that he has become addicted to a bad habit of which he should speedily rid himself. He will give a jump, and may land 3 or 4 feet ahead of the other horse, and perchance lean back in his collar again, but just as soon as that noose begins to draw on his tail Mr. Horse will begin to move, and after two or three times backing up on the noose he will walk right off, and, with most horses, the balking habit will be completely overcome. This treatment will not injure the animal, but it will teach him a valuable lesson which is hard to learn in any other way.”

[We have seen a confirmed jibber induced to move along by simply passing a rope round his knee and pulling gently on it when the leg is lifted.—Ed. “Q.A.J.”]

Poultry.

DESICCATED EGGS.

From a report lately made by Mr. J. B. Larke, Trade Commissioner for New Zealand, it appears that a new process has been devised in Melbourne for desiccating eggs. He describes the process as follows:—

“Desiccated eggs are not substitutes for eggs, but newly-laid eggs treated by a process by which only the shell and water contents of the egg are removed, and the whole substance of the egg, yolk, and albumen converted into powder. The eggs first pass through a dark room, being carried on a perforated rolling table over a 50-candle-power-light. Any eggs not perfectly fresh, or dirty in any way, are at once detected and put on one side. The sound eggs are carried along and go into a centrifugal separator, revolving at a tremendous rate. Here the eggs are smashed, and the shells separated from the liquid matter which flows into a small tank, and is then pumped up to another tank, where a preservative is added. Below this tank, in a very hot room, with a temperature of 120 to 130 degrees, there are great cylinders, or drums, slowly revolving at the rate of one to two and one-half minutes. The liquid egg substance goes from the tank into troughs below these cylinders, and, as they revolve, become attached to them. By the time a cylinder has completed its revolution the coating has dried, and a further coating adheres. Ultimately this coating comes off in flaky pieces, which are ground into a powder.

“This powder will, it is claimed to have been proven, keep for years, and only requires the addition of milk or water, when the powdered eggs will reconstitute, and be ready for use for any purpose the same as a newly-laid egg. The powder is rich and attractive-looking and is reported by the Government Analysts of New South Wales and Victoria to contain no chemical preservative. No part of the egg, except the water, has been removed.

“There is no question that if this process were perfect, as the newspapers state, it would be of great value. It must, however, be added that the process is not yet perfected. The inventor has some difficulties still to overcome before it can be a commercial success, one of which is the reduction of the dried egg to powder. It is hoped that this and other obstacles to success will shortly be overcome.”

ARTIFICIAL INCUBATION BY ELECTRICITY.

Incubation by electricity is the latest innovation in the poultry world. After three years of experimenting, Otto Schultz, an electrician of Strassburg, claims to have perfected a device whereby eggs are hatched with the artificial aid of the fluid which is working such wonders in other fields. In the electric incubator the automatic attachment keeps the temperature within one-tenth of a degree of the normal temperature of incubation. The degree of moisture in the air is also kept automatically. It is claimed for the electrical device that under ordinary conditions 90 chicks can be counted on out of 100 eggs. The amount of electricity consumed is very small. The brooder for raising the chickens after they are hatched is also heated by electricity. The upper part of the brooder is arranged for newly-hatched chicks, and is heated by electricity. The lower part is also warmed by the same means, and built so the chicks can run outside to eat and at the same time find protection and warmth within. This new wonder (says the “Rural Californian”) will doubtless soon be on exhibition at the poultry shows and fairs, and it is needless to guess that great curiosity will be felt by all progressive breeders to examine and test its merits.

Botany.

ON THE SO-CALLED "AFRICAN WONDER GRASS."

By F. MANSON BAILEY, F.L.S., Colonial Botanist.

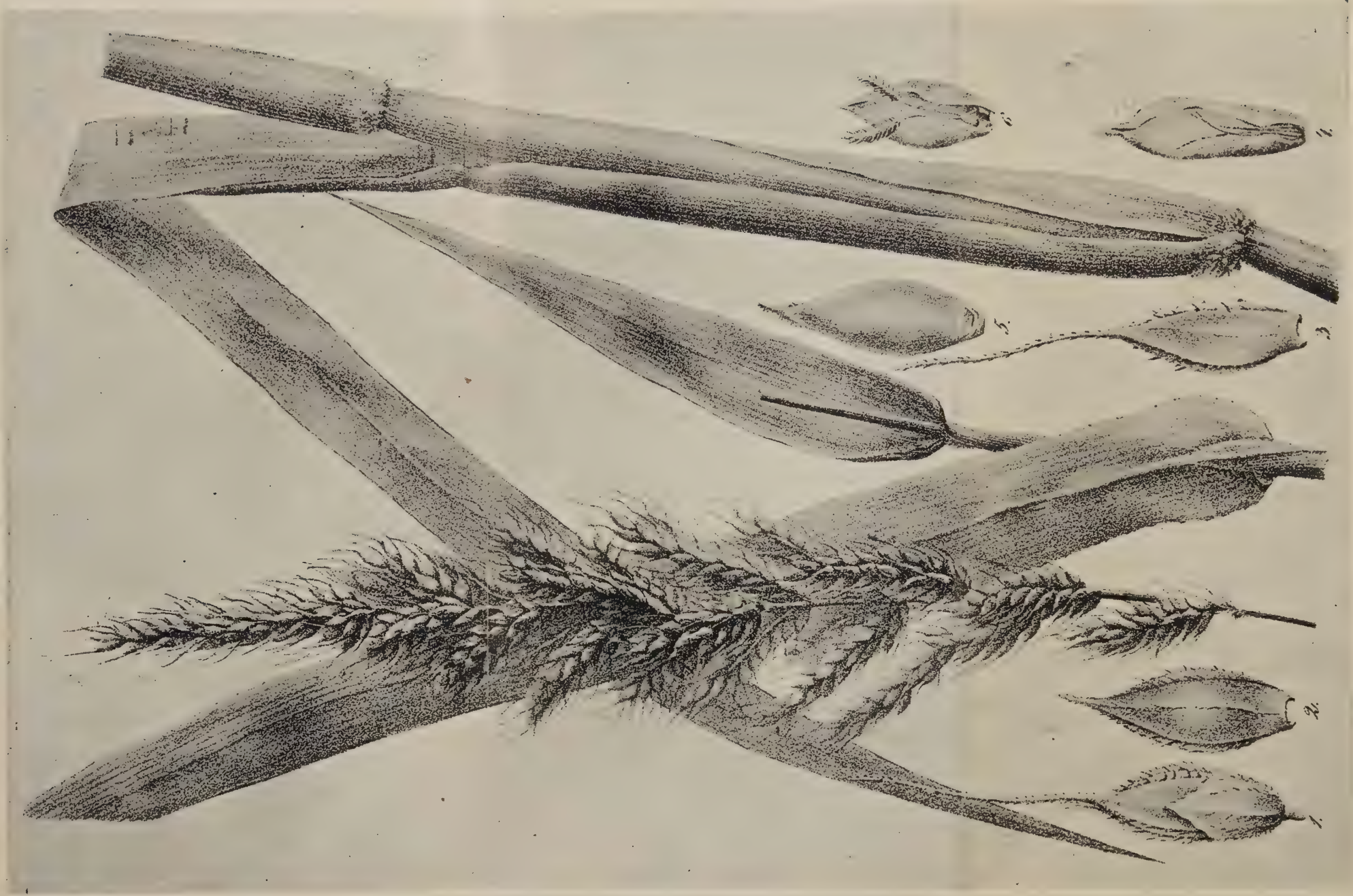
There having been considerable controversy relative to the nomenclature of the so-called "Wonder Grass," *Panicum muticum*, Forsk., I have been requested by the Under Secretary to say a few words on the subject, as this species is being grown and distributed under the name of *P. spectabile*, Nees., because it is said that the late Baron Mueller sent to Queensland seed of a grass labelled *P. spectabile*, Nees. This is no proof of the correctness of the name, for no doubt the Baron received the seed under the latter name, and, thinking that it would be a suitable grass for this State, sent it here without testing it to find out the correctness or otherwise of the name. I might mention that I often receive seeds in this way from other countries, and—especially in the case of grasses—cannot always vouch for the correctness of the names.

In the hope of making the matter clearer to those interested, three illustrations are here given, Plate I. and Plate II. being reproductions from Trinius' species Graminum, and Plate III., representing a specimen grown by the late Dr. Joseph Bancroft, and is identical with those received from Mr. R. Simmons. The following letter was recently sent to the Department by Mr. Simmons:—"Dear Sir,— . . . This grass was sent to the gardens about twenty-four years ago, by the late Baron Ferd. von Mueller, as *Panicum spectabile*, and has been known here as such ever since. Recently I sent a specimen of it to Mr. F. M. Bailey, and he says it is *Panicum muticum*. I may say in connection with it that a good many people are under the impression that it is capable of resisting drought, but that is a mistake, as it prefers, and indeed will only flourish in, localities where it has abundant moisture.—I have, &c., R. Simmons." The grass on Plate II. is figured by Trinius under the name of *P. barbinode*, Trin., but Sir Joseph Hooker, in his "Flora of British India," and also in the "Flora of Ceylon" (where he states that "*P. muticum* is growing wild and cultivated in swampy places"), includes *P. barbinode*, Trin., and others—as many as fourteen—as synonyms of *P. muticum*, Forsk. In the plates will be seen the distinction, but the difference in growth may be given, as in *P. spectabile* it is erect, and in *P. muticum* ascending or procumbent.

THE PROPHET'S MARES.

Mohammed, according to tradition, set great store by the readiness of horses to obey any signal to which they had been made accustomed, and he selected mares for breeding purposes by a test of their obedience. He shut up a drove of mares within sight of water, and kept them without drink till they were almost famished with thirst. Then the drove was released, and, naturally, started at a headlong gallop for the water. When they were in full flight a trumpet sounded the "halt." Only five, some say three, mares obeyed the call and stopped, the rest being intent on assuaging their thirst. The three obedient mares were chosen as dams, and were honoured by the title of "The Prophet's Mares."

Plate II.

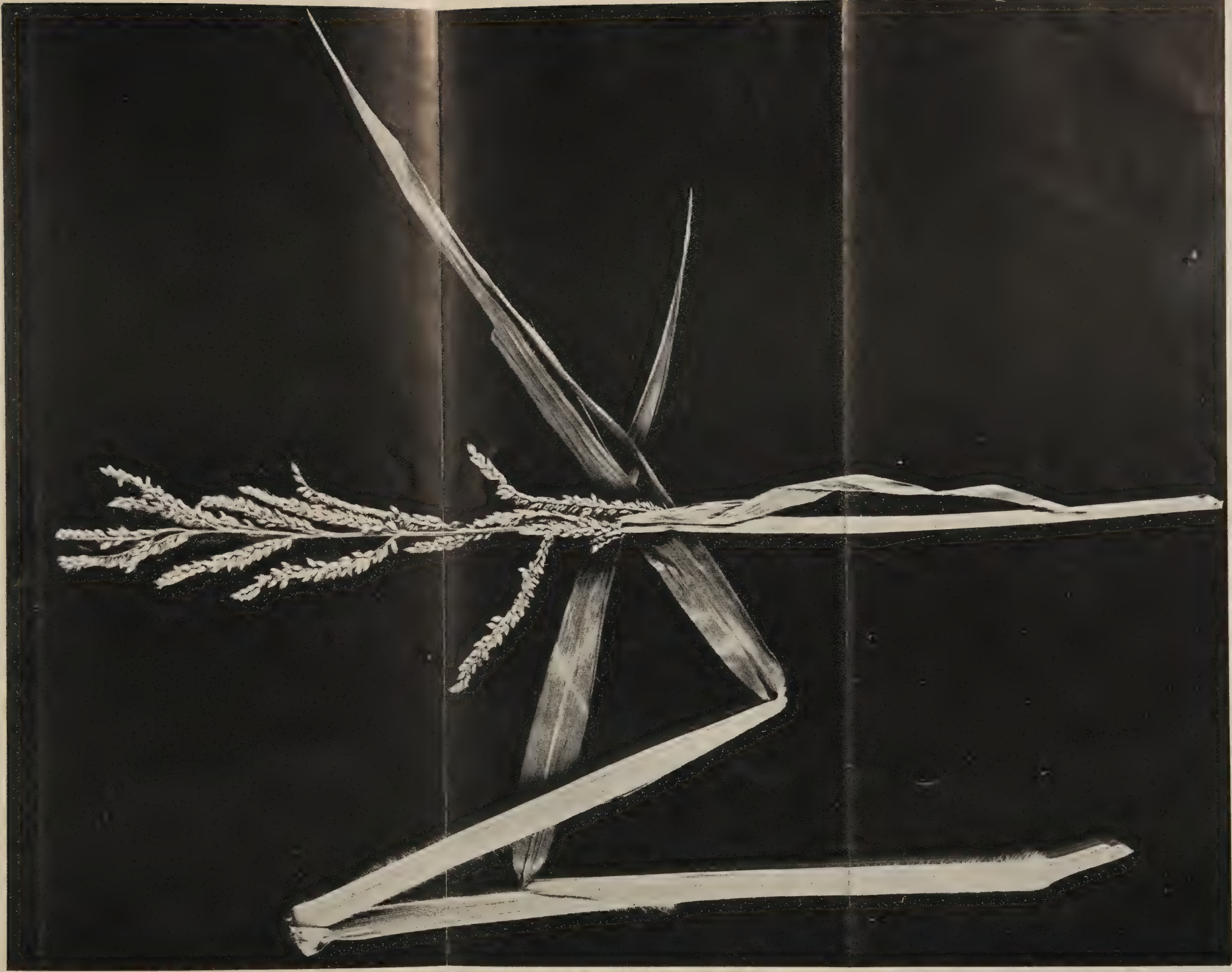


Panicum spectabile, Nees.



Panicum barbinode, Trin.

Plate IV.



Panicum muticum, Forsk.

The Orchard.

QUEENSLAND BANANAS.

In connection with the banana trade of Queensland with the Southern States, "The Fruit World" (20th May) says:—

Undoubtedly the banana, of all fruits, is easily first from a large consuming public point of view. Apples and pears are too costly at 3d. and 4d. to 6d. per lb. retail, and our masses must perforce buy their fruit cheaper than this or do without it. Bananas, at 4d. to 6d. per dozen, gives them a regular supply for home use. This is so in most parts of the world.

Then it is a fruit of valuable food properties, being composed of 22 per cent. of starchy substance.

Atwater, chemist of the Agricultural Department of the United States, in making a comparison of the value of the apple, orange, and banana, showed their composition to be as follows:—

	Water.	Proteid.	Fat.	Carbo-hydrate.	Ash.
Apple ...	84.6	0.4	0.5	14.2	0.3
Orange ...	86.9	0.8	0.2	11.6	0.5
Banana ...	75.3	1.3	0.6	22.0	0.8

Speaking on the nutritive value of the fruit, Sir James Crichton-Browne, an eminent English physician, lately said, "I wish all school children could have bananas from time to time, as they are food fruit, containing in an agreeable form all the essential elements of nutrition. The banana, when of the proper degree of ripeness is, in the guise of a cheap luxury, a substantial addition to our food supply, likely to commend itself more and more to the working classes in our large towns."

The importations from Queensland during the last five years are as follow:—

Period.	Bunches.	Cases.
1st July, 1902, to 30th June, 1903 ...	767,481	3,234
1st July, 1903, to 30th June, 1904 ...	653,639	667
1st July, 1904, to 30th June, 1905 ...	658,981	3,899
1st July, 1905, to 30th June, 1906 ...	403,775	1,630
1st July, 1906, to 30th June, 1907 ...	443,760	17,726

The statistics appear to indicate that the consumption fell away from 767,481 bunches and 3,234 cases in 1902-3, to 403,775 bunches and 163 cases in 1905-6. But this is mainly accounted for by devastation in the fields by cyclonic visitation.

MATURE FRUIT.—It would be considerably better if the fruit could be forwarded in not such an immature stage as is generally the case. The sugars of the fruit are prevented from developing, and most of the fruits are not so good for food purposes, in fact some bananas recently seen in Adelaide would be more likely to tax the digestive apparatus than help it.

The reason of this is, of course, the fear of fruit fly; and the receiving of green fruit only is an undoubted preventive measure for importing States; but surely the other extreme of sending unfilled fruit is against all sense. Could not the banana be picked green, and therefore fly safe, and be timed to reach this market to ripen up lusciously and full of its fine flavour and food qualities?

WHAT QUEENSLAND SAYS.

In this connection, Mr. A. H. Benson writes to us as follows:—

Re the unripe condition in which you get our bananas—that is not our fault, as should the fruit arrive coloured, it is either condemned for fruit fly

or else it is said to be too ripe for your trade, and dealers will not take it. In other words, your people demand a half-grown fruit, and you get it. If you can educate them to know better, we will be glad to send you better filled fruit, provided that we can get the steamship combine to give us better ventilated holds, so that the fruit will carry better. To land fruit as you want it at present our growers have to cut it about half-filled.

Our Northern growers are obliged to cut the fruit so immature, in fact, that the fruit will keep its green colour during the journey from the North to Melbourne, and still arrive in a green condition, and take days or weeks to ripen. The question of netting the fruit prior to shipment will not result in the growers allowing it to become better filled under present conditions, as if allowed to become better filled or more mature on the plant, it will ripen up quicker in transit, and you will get fine good luscious ripe fruit on its arrival, instead of the green which your market demands.

The present method of transporting bananas is, in my opinion, all wrong, and this Department is in communication with the steamship companies on this matter, as, in order to give you better fruit, we must have such accommodation for it on the boats that there is some chances of its reaching its destination in good order; at present only very green fruit will carry.

Fruit cut seven days in the tropics would not carry to Brisbane let alone Melbourne. The bunches are covered with the netting, thus ensuring immunity from the attack of the fruit fly, and, as soon as they are sufficiently developed, with the saving clause of immaturity which your people like, they are cut and shipped right away.

Were it possible for the fruit to be carried under more favourable conditions, and I see no reason why it should not, then it would be possible to allow the fruit to become properly matured here, so that you would get a full fruit with its full flavour instead of the immature article you usually get.

THE HARDY ROSELLA.

We have received from Mr. E. J. Phayre, Woolloowin, a very fine sample of rosellas, which, he says, are an average sample of the first picking from his plants on 27th May. The plants were grown on gravelly soil, and no manure was applied to them. Any moderately good soil will grow rosellas well. Land with a clay subsoil, if the latter be near the surface, is, however, to be avoided. A well-drained, gravelly soil suits the requirements of the plants, as is evidenced by the fine fruit grown by Mr. Phayre.

CATTLE TICKS AND THE MONGOOSE.

The history of the cattle tick in Jamaica is bound up with that of the mongoose. In 1872 nine mongooses were imported by Mr. Espent, in the hope that they would thrive and exterminate the "cane rat," which was making impossible the cultivation of sugar. The mongoose thrived and multiplied, and, by destroying the rats, restored the sugar-cane industry, and also made the cultivation of cocoa possible. But, when the cane rats had become few, and the mongooses many, the latter turned their attention to ground-nesting birds, and decimated these; also, they drove the surviving rats to change their habits, and make their nests in trees. Between mongoose and tree-climbing rat the birds suffered terribly, and the disappearance of insectivorous birds was soon followed by the spread of the ticks, which theretofore the birds had kept under, until the ticks became so prevalent as to be a perfect scourge.

Horticulture

FLOWER GARDENING.—No. 6.

By THE EDITOR.

PLANTS SUITABLE FOR OUTDOOR CULTURE.

FUCHSIAS.

Many of these graceful plants are amongst the most beautiful of hardy or half-hardy plants for outside borders, while others of a more tender constitution are more adapted for inside culture. Whether plants be required of a large size for exhibition, or others of smaller proportions for greenhouse or window decoration, centres of vases, and outside flower borders, the fuchsia is equally well adapted for one and all.

Propagation is effected by seeds for the raising of new varieties, and by cuttings for the perpetuation of those already obtained, or for any of the species. Seeds ripen freely in summer on the majority of plants, if they are required. When ripe, they should be washed from the pulp surrounding them, and afterwards dried, being then either sown at once or kept till the following spring.

CULTIVATION.

Cuttings of fuchsias obtained from the points of young, growing shoots that are free from flowers root readily at any season. The best are those produced from old plants when started in early spring, and these may be grown very rapidly the following summer. The general treatment in the early stages is similar at any season. The cuttings should be placed in light soil, about six in a 3-inch pot, and plunged in a warm propagating frame. When rooted, they should be potted singly, and kept in a light position to induce a short-jointed sturdy growth. A temperature of about 60 degrees, with a rise by sun heat, is one most suitable for the young plants in spring, and plenty of water should be applied, with a syringing in the morning and afternoon. Apart from inducing growth, this tends to keep down insects. Many of the best-habited varieties will require but little stopping or training beyond placing a stick to the leading growth and looping the others to it. Before the roots become much restricted for room, the plants should be placed in 5-inch or 6-inch pots, in which any of the plants will flower if so desired, or they may then be transferred of almost any ordinary size. Fuchsias will succeed, if proper attention be bestowed, in almost any soil; but, where there is a choice, 2 parts loam to 1 of cow dung, or any other good manure, should be selected, well mixed, and used in a lumpy state. Plenty of air and a slight shade are necessary for plants grown under glass in summer, particularly when flowering. Liquid manure may be used with advantage so soon as the pots are filled with roots. Stock plants, or any required for growing another year, may be ripened outside; and, in frosty districts, such as the Darling Downs and parts of the Southern Queensland border, stored in any cool dry place. These should not be repotted until new growth has commenced. Tender varieties, grown in the open air, should be at least one year old when planted out, and they may be lifted and treated in a similar way.

NEW RACE OF FUCHSIAS.

During the past few years there has been a revival in the interest taken in this useful class of plants in England, but in the ordinary varieties no very great improvement has been made, yet some very distinct hybrids from triphylla, corymbiflora, and fulgens, of which it would be difficult to give the

exact parentage, have been produced. They are chiefly of Continental origin, and some of them are remarkably pretty, and the terminal corymbs continue to elongate, and keep up a succession of bloom for a long period. A contributor to the "Garden," Mr. H. J. Jones, of Lewisham, has introduced a most interesting collection, and having seen them from time to time all through the season, I can say that they are certainly worthy of attention. They are readily propagated from cuttings in the spring, and give little trouble. Potting in good loam containing some manure and sand, careful watering, and giving liquid manure when the pots are full of roots will ensure success. They may require a little shade during very bright weather, but the more light they can have the better. It is only when the air is very clear and the sun comes out that they are likely to suffer. They may be potted on into fairly large pots, and will not require so much attention. When growing freely they take up large quantities of water, and it is when they are allowed to get a little too dry that they are most liable to suffer from the effects of the sun. I have noted the following as being amongst the best (it would be better if some of the names were Anglicised):—Gartenmeister Bonstedt, the flowers are clear orange-scarlet, with long tube and short lobes, and are produced in drooping terminal racemes, the leaves broad, with dark veins; Gottingen is of similar habit, with flowers of a deeper shade of colour; Coralle, apricot with a coral-red shade; Traudchen Bonstedt, pale salmon-pink with light tips to sepals, very distinct pale-green foliage; Andenken An H. Henkel, red, with a rosy-pink shade, dark foliage; Thalia, clear-orange, rather large broad leaves with dark veins and stems; Furst Otto von Wernigerode, rosy-pink flowers, produced in loose racemes, very distinct in habit; Mary, rich crimson flowers in drooping terminal racemes, long narrow leaves, but in this I find the strong secondary shoots shorter, broad leaves; and Eros, dwarf-growing, with pale-green leaves and terminal clusters of short-tubed flowers, which stand erect, and are of a pale-salmon with yellow shade.

SOME GOOD VARIETIES.

Single.

Beauty of Exeter.—A mixture of white and crimson, very floriferous.

General Roberts.—Of beautiful habit; flowers 4 inches long, sepals rose, deepening into the corolla to shaded crimson.

Fuchsia procumbens.—As a basket plant or for window-box culture the graceful trailing Fuchsia procumbens is one of the most desirable. The interesting little flowers are followed by large bright-red fruit. The plant, when not in bloom, has a close resemblance to Muhlenbeckia complexa. Grown with Asparagus sprengeri it is very effective.

Rose of Castile.—White sepals, corolla, violet.

Mrs. Rundle.—Flowers $2\frac{1}{2}$ inches long, with spreading sepals, $4\frac{1}{2}$ inches across; sepals, flesh colour, corolla, orange-scarlet.

Double.

Avalanche.—Tube and sepals crimson, corolla, purple.

Countess of Hopetoun.—Very large corolla, pure white, dark red sepals.

Jumna.—Short tube, and very broad, bright crimson sepals; very large rich, purple, double corolla; base marked with rosy crimson.

Other good double fuchsias are—Mrs. Marshall, Jubilee, La France, Frau Emma Topfer, Molesworth, Mrs. E. G. Hill.

COCKSCOMB (*Celosia*).

There are a great number of varieties of this species, all of which are very ornamental. They grow to perfection in the open air almost everywhere in Queensland. A good specimen of *C. cristata* should not be more than 9 inches high, and quite as wide over the top of the flower head, which

should be as thick as possible, and of a dense colour. For this great heat is needed, hence they are at their best here during the months of February and March. The best soil to grow celosias is in a half-rich sandy loam, with half-rotten cow and stable manure mixed with a good dash of silver sand. Seed should be sown about August and September, in pans or in well-drained sandy soil. Care must be taken that the soil does not get dry. When the plants are large enough to handle they may be planted out. Grow them as quickly as possible, and keep them rather dry to induce flowering.

VARIETIES.

C. argentia, *C. cernua*, *C. cristata*, *C. cristata variegata*, *C. c. comosa*, *C. Huttonii*, *C. pyramidalis*, *C. c. coccinea*.

PEONY.

There are two distinct sections of peonies in general cultivation, both of which are exceedingly ornamental and useful for out-door decoration. The Moutan, or tree peony, is a sub-shrubby plant, of which there are many varieties. The other section is that of the herbaceous peony, the representatives of which annually form flower stems that also die down each year. Peonies of any sort prefer a rich, deep soil, which should be well trenched before planting and have some rotten manure incorporated. A top-dressing of the latter should also be given, and manure water in summer is beneficial when growth is being made. Herbaceous varieties succeed in almost any position, and, when in flower, are very effective and showy subjects. On this account they are, in European gardens, usually planted in the front part of shrubberies, and of wide, mixed borders. They may also be planted in beds by themselves, in positions where an effect from a distance is desired.

Tree, or Moutan peonies, very frequently suffer from the effects of spring frosts. These varieties should succeed well in Queensland, yet we never see them in our gardens, although seeds and roots have from time to time been imported, usually arriving in a decayed condition.

A mulching of manure over the surface of the soil in summer is a great help, by affording nutriment, and also preventing evaporation.

Tree peonies may also be grown in pots, and they may be gradually forced to flower in July, but this renders them useless for a similar purpose for a year or two afterwards. To maintain an annual exhibition indoors, three sets of plants should therefore be provided, one being introduced every third year.

PROPAGATION.

Propagation of herbaceous peonies is effected by division, but this should not be practised more than is necessary, because of its weakening influence on the parent plant. Large clumps soon form when they are well manured and left alone; they should not be planted too deeply.

VARIETIES WHICH MIGHT BE SUCCESSFULLY GROWN IN QUEENSLAND.

P. Moutan, *P. albiflora*, *P. anomala*, *P. arietina*, *P. decora*, *P. Californica*.

PANSIES.

Pansies have been grown for years, under the name of Heartsease, in all gardens, in the temperate and sub-tropical zones. No capital, such as demanded by orchids, for instance, is required to produce flowers of wonderful diversity in colour and marking which the different flowers exhibit, and the ornamental and floriferous habit the plants assume. Even those who are not sufficiently interested in pansies to grow a collection of named varieties, may procure a packet of mixed seeds, and raise any quantity of plants, that will be scarcely less ornamental for the hardy flower garden or mixed border.

PROPAGATION.

Pansies are readily multiplied by seeds, cuttings, and sometimes by layers. Seeds may be sown at almost any time of the cool season, but as planting-out is best performed in spring or early autumn, it is advisable to sow with a view to preparing plants for these two seasons.

The best way to raise plants is to sow the seeds in shallow boxes in the same manner that small seeds are raised by horticulturists. The box must be filled with light sandy loamy soil—a good light garden soil will do very well. Make the surface perfectly smooth, and scatter the seeds evenly on it. They must not be covered deeply, and, to avoid this, sift some light soil over them, covering them to a depth of less than one-quarter of an inch. This done, give them a very gentle sprinkling of water, and set the box in a sheltered situation. In about a week or ten days the little shoots will appear above ground. Then, when watering is required, it must be done from a very fine-holed watering can. When the plants are from 2 to 3 inches high, they may be set out. Always, if possible, choose a dull day for doing this. The permanent bed must be deeply dug, and the soil rendered mellow. Set the plants out about 8 inches apart each way. In less than a couple of months they will be in flower, and will continue to bloom until next autumn. The soil must be regularly worked, and plenty of moisture should be supplied. It is a good plan to give them a little liquid manure occasionally to help them along. If flowers for exhibition are required, only about four or six main shoots should be allowed each plant, others being pinched off occasionally as they are formed. All blossoms should be picked off regularly to prevent the formation of seed pods, which naturally weakens the plant, and to increase the size of the flowers. With very slight care lovely little beds of pansies can be raised, even by the children of the house, whether in town or country. All children love flowers, and every encouragement should be given them to engage in such a charming occupation as simple flower-gardening.

What should a good pansy look like? is often asked. The florists demand that a pansy, to be perfect, must have a round outline, flat and very smooth edge, petals thick and velvety, the three lower petals alike in their ground colour, the lines and markings in the centre bright and distinct, the two upper petals (which always differ in colour from the others, except in solid colour sorts) perfectly uniform, and the flower to measure at least $1\frac{1}{2}$ inches in diameter.

VARIETIES OF THE PANSY.

The number of varieties may be said to be legion, so great a variation in colour and markings do the plants represent. There are two sections into which pansies are divided—namely, fancy and show; and varieties of the latter are further subdivided, according to the colour of their flowers, into three classes, termed, respectively, Selfs, White Grounds, and Yellow Grounds.

The Selfs are either black, maroon, primrose, white, or yellow. White Grounds have a large, central, dark blotch round the eye, then a ring either of white or cream colour, and an outer band of bronze, purple, or maroon. Fancy, or Belgian pansies, have various colours and tints curiously blended in their different flowers, the petals being blotched, flamed and edged, and quite distinct from those of the show section. A third section is sometimes made of bedding varieties. These are usually self-coloured, and are distinguished by their compact and floriferous habit, and, as a rule, small flowers. They are more generally known as *Violas*. The line of demarcation, however, between a *viola* and a pansy is now practically undefinable.

SOME FINE PANSIES.

Bugnot's Exhibition.—This splendid French variety is, without question, the most striking one ever raised. Immensely large, of the Giant Odier type, the surface covered with fine hair-like lines.

Odier, or Blotched; Belgian, or Fancy; Giant King of the Blacks; Giant Trimardeau.—Some of the flowers of this distinct and beautiful class have measured 4 inches in diameter; Fire King, Danish Exhibition, &c.

VIOLETS.

Like the pansies, the garden violets have been derived from the *viola*, of which there are a great number of species. The only ones, however, which are cultivated by horticulturists are the garden types which have been derived from the indigenous British sweet violets. Great improvement has been effected in this charming perfume flower, in increasing the size of the bloom, and introducing more varied colouring into them, without diminishing the characteristic perfume. The single varieties, in particular, have been improved. The double-flower violets have been produced from a variety of the common violet, the Neapolitan. The double types, though not as hardy as the single kinds, are also popular garden plants, flowering freely under suitable conditions. The flowers are delightfully fragrant, the perfume in many varieties resembling that of the wall-flower.

The violet thrives admirably everywhere in the Southern districts of Queensland, and particularly on the Darling Downs, where large quantities are grown for transmission all over the State. Although the plant can stand a considerable amount of heat, it will only thrive in our tropical North under the most careful conditions of cultivation.

The violet succeeds best in a fairly heavy soil that has been deeply worked and moderately manured. An excessive quantity of nitrogenous manure will cause the production of an excess of gross foliage and very little bloom. The usual position assigned to violets is that of edging plants, for which purpose they are specially suitable. The single-flowered varieties will thrive in any aspect excepting an excessively shaded one, but the double varieties require a rather shaded position unless the soil is cool and moist. Red spider is the principal insect pest of the violet, and is difficult to exterminate, owing to its attacking the under surface of the leaf. When the plants are badly affected, the leaves become yellow in colour, and should be cut off and burned; in the case of plants newly set out, the application of water is necessary.

Violet plants bloom freely for two seasons, after which they become weak and straggling in habit, and the flowers produced are poor and few. The plants should be renewed after the second year, fresh soil being necessary to ensure success. Strong sturdy runners, with roots attached, should be selected, and planted either in the spring or autumn. The plants should be mulched with rotten manure early in summer.

I have adapted the above, to a great extent, from a paper on the subject in "The Australian Gardener," by J. Cronin.

Violets are propagated chiefly from runners which are freely produced by the parent plants. Five or six of the strongest should be selected, and the points pinched off; all succeeding runners must be cut out, so as to throw as much strength as possible into those selected for transplanting.

SOME GOOD VARIETIES.

Double-flowered: Neapolitan and De Parme, mauve; Marie Louise, lavender blue; New York, violet; Lady Hume Campbell, mauve; Count Brazza, white; Madame Millet, rose; and King of Violets, dark blue. Single-flowered: Admiral Avellan, White Czar.

A FLORAL MIRACLE.

Under this title the "American Farmer" tells of the production of an improved variety of the cactus dahlia. The writer is evidently not very well posted as to flowers; he speaks as though the cactus dahlia was a new thing,

when it has been offered by florists for several years. Probably the new variety is an improvement on any which were in existence before, still they were well worth cultivating all the time.

Great are the achievements of the floriculture experiments. Things beautiful are made still more beautiful, and unlovely things are deprived of their ugliness. Burbank takes the cactus in hand with its prickly leaves and forbidding thorns. The wand of genius touches the plant, and behold a transformation excelling the utmost achievement of Aladdin. The thorns have disappeared, the harshness is all gone, and we see before us a plant not only harmless but useful. A Chicago florist, completely reversing the process, puts thorns on the gentle dahlia. They are not stiff and stinging, however, and that would be a calamity instead of improvement. The petals have simply been transformed into floral needles which, in general appearance, with the exception of the rich colouring, bear a striking resemblance to the thorns of the desert plant. Thus the cactus dahlia emerges as the latest floral wonder, a witness extraordinary of what can be done by man operating along the lines of evolutionary science.

This floral miracle was evolved through elaborate culture processes at the Vaughan hothouses in Western Springs. It has been grown in three principal colours—yellow, scarlet, and pale-pink. At the Coliseum show last November it received "esthetic homage" from all flower lovers who attended the exhibition. An enthusiast wrote—"The fluffy chrysanthemum and other old-time favourites will have to take back seats in presence of this new flower queen, certainly until the novelty wears off. Even the peerless American beauty rose and all her lovely sisters will have to step aside while the cactus dahlia passes with her wondrous new equipment of needles. The band will play "Hail to the Chief," the ushers will bow obsequiously, and the chorus will sing hosannas in praise of the new wonder that attests the supreme achievement of experimental genius. By all means Burbank should be invited to come and bring his dethorned cactus to be placed beside its more civilised sister. Then it may be explained how the needles taken away from the cactus have been transferred to the dahlia without their sting and offensive qualities. The occasion will be one of wonderful interest, not simply for flower lovers or the general multitude, but for all scientists and others interested in these famous illustrations of the truth of Darwin's theory as set forth in his epoch-making book on the "Origin of Species." In this publication, which was the greatest achievement of the nineteenth century, and most far-reaching in its results, was for the first time unfolded one of the most interesting secrets of Nature. It explained elaborately the processes by which an original type—either animal or vegetable—was differentiated into species. The operations were all under the natural law, and long periods, sometimes ages, were required for Dame Nature to do her work. But once possessed of her secret, man may step in and facilitate the process. He can take short cuts and push things, thus accomplishing with comparative speed what in Nature requires so much time.

Much has already been accomplished for agriculture by taking advantage of the Darwinian knowledge and pursuing the Darwinian methods. It is in this way all the new grains, new fruits, new grasses, and new flowers have been produced. Burbank used the method in taking the thorns off of cactus, Vaughan used it to transfer them in modified form to the dahlia, and every breeder who has given us a new kind of cattle, sheep, or hogs has simply followed Nature as expounded by Darwin. Nothing can be done in opposition to the natural law; almost anything may be done by following it and artificially assisting the process. It can not be doubted that scientific agriculture of the future will depend for advancement and success upon the wonderful discovery of the kindly and gentle English philosopher. The possibilities of the process, patiently pursued, are limitless in the floral, horticultural, and

general agricultural world. To make our country worthy of the twenty-first century, to bring about the changes that will be necessary to enable our farmers to feed the teeming millions of the future, the brains of the inventors and experimenters will be kept busy.

SCHOOL-GARDENING IN THE PHILIPPINES.

Whilst school-gardening is in its infancy in Queensland, we find that it is made a serious business of in the West Indies and in the Philippine Islands. Following is an account taken from the report of Mr. North H. Foreman, supervising teacher at Lubao-Aringay, La Union, Philippines, on school-gardening in that province, published in the "Philippine Agricultural Review":—

Last year, during the month of January, a contribution list for the purchase of seeds was begun in each school. No assessments were made, and no amount stated as desired. As a result of this effort we soon had on hand P35 of seed money. I personally assured each pupil a garden and seed for the same. Every teacher was required to keep a list of the names of all pupils who contributed, and the amount. This list is filed in my office, and is now used in the distribution of seeds to pupils for home gardens. In no case was there a contribution of more than 5 centavos, and the most of the contributions were 2 and 3 centavos each. Eggs, cocoanuts, pineapples, &c., were accepted, and sold in the markets. The sum raised was spent chiefly with a firm in Chicago and one in Los Angeles, for the purchase of about 50 lb. of seed, which arrived by mail during the month of May. The seeds consisted of seventy-four varieties, many of which were unknown in the Philippines. I found it advantageous to buy in bulk, as in this way you get many more seeds for a given amount of money, and many of our varieties were received in $\frac{1}{2}$ -lb. and $\frac{1}{4}$ -lb. packages. The seeds were divided among the different barrios, according to the amount of contribution, and all schools have had many varieties to give the pupils for planting at home.

As a means of encouragement, I shall offer a prize to the pupil who raises the finest specimen of each thing planted. Pupils are permitted to submit in this competition products from their home gardens, as many of the pupils have home gardens, which I personally inspect and encourage as much as possible. If a pupil can produce better plants in his home garden than we do in the school garden I want to know it, and also how it was done.

I now have on my hands one more garden in Tubao than was desired. The first-grade pupils were told that they would have no garden, as they were too small. This announcement brought forth requests, petitions, and a few tears, until I told the children in this grade to go to work. To have seen pupils seven or eight years old carrying bamboo and working their plots would convince anyone that the Ilocanos are agriculturally inclined.

A garden is now found at every school, and is part of the school work. The central school of Aringay has an excellent flower garden, containing many beautiful flowers; also some experimental plats, and a vegetable garden. The central school of Tubao has two large gardens. All of these gardens are located near the schoolhouse—in most cases adjoining the schoolhouse.

The general arrangement was to assign a certain part of the garden to each class, the teacher in charge of the class also having charge of the garden. I found that awakening a certain amount of class rivalry, lent interest to the work. In the central schools the teachers have immediate charge, but in barrio schools each class chooses a leader, the teacher having an oversight of the work. This was found necessary, as the barrios contained but one teacher each.

The part of the garden assigned to each class was subdivided, and each member of the class was given a small plat. That plat was his. He planted

what he liked, and all the work in preparing the ground and cultivating the plants was done by himself. This arrangement gave each individual pupil a definite ownership. In the assignment of plats both boys and girls were included.

PREPARATION OF GARDEN.

No difficulty was experienced in securing the necessary land, and I found it best to build with school labour the fences required. Each pupil in the school donated a portion of the bamboo needed, and the older boys, under the guidance of the teacher, built the fences.

Every garden in my district was fenced by the pupils. These fences were built in July, after which no more "general" work was done, each pupil being interested in his own plat and working on it alone. As the rains are heavy, borders were placed around each plat. These borders were made of rock, brick, bamboo, or sod, the material that was most plentiful in the barrio being used. Numerous wide paths were made so as to give the pupils ample room for their work without stepping on the beds.

FERTILISERS.

The kinds and uses of fertilisers were taught, and each pupil was required to fertilise his own garden, some of my best gardens having been on worn-out land. The pupils carried fertiliser in baskets from their homes. After the ground was prepared to a depth of 8 inches, the seeds were planted. In order to give needed instructions in the preparation of seed beds a part of each pupil's garden was used as a seed bed.

CARE OF GARDEN.

Each pupil was required to have at the school some vessel for carrying water. Some of the schools had water close at hand, and in others it was necessary to carry the water nearly 1 mile. The girls usually brought water in jars, while the boys used a long bamboo; in two barrios nothing but bamboo was used. Each school had one or more sprinklers. Some plants required daily watering, and others were watered once every two days. On Saturdays and other holidays a committee was chosen from each class to water the class garden, but many pupils preferred to come and water their own plat rather than trust a committee.

RESULTS.

When the products were ready to be used the pupils were encouraged to take them home, each pupil having been previously instructed in regard to their use. Many a proud boy or girl trudged home with three or four radishes, beets, or turnips, but no pupil was permitted to take all of any one kind from his garden. At least one plant was left for seed, each pupil being required to save seed from each kind planted in his garden. This seed was divided into two equal parts, one part for the pupil, the other to be kept for the school garden next year. Pupils were taught that saving of the seed was quite as essential as the planting of the garden.

I will not attempt to attach a list of all plants that were grown in these gardens, but the following is a general summary:—

Aringay :						Varieties.
Vegetable garden	...	...	...	...	...	52
Flower garden	...	...	...	...	...	126
Experimental plats	...	...	...	...	...	12
Cava :						
Vegetable garden	...	...	...	...	...	20
Santa Cecilia	...	...	...	...	...	37
Tubao :						
Vegetable garden No. 1	...	...	...	...	...	30
First-grade vegetable garden No. 2	...	...	...	...	...	50

Santa Tereza:							
Vegetable garden	...	...	...	...	...	...	35
Rizal:							
Vegetables	...	...	...	...	...	...	29
Anduyan:							
Vegetables	...	...	...	...	...	...	27
Ambanganan:							
Vegetables	...	...	...	...	...	...	18

Experiments were made in the experimental gardens with the following:—

Broom corn: Grew well, and had good long brushes. Winter wheat: Grew well, good head. Flax: Grew well, good stem and plenty of seeds. Spring wheat: Grew fairly well. Buckwheat: Grew well, but did not get large. Millet: Grew well, good head. Rutabaga: Grew well, good root. Sugar beet: Bad seed. Sugar corn: Only fair stand. Sunflowers: Large heads, some 18 inches across. Sage: Grew well, but was killed by animals. Peas: Failed, few pods.

INTEREST SHOWN.

In no case have I any complaint to make of lack of interest shown by pupils. All of the pupils were willing to work, and felt slighted if not given a garden. As an example, I give the following occurrence in Tubao: It was first intended to have only one garden in Tubao, and have only second, third, and fourth grade pupils do garden work. The first-grade pupils objected to this arrangement, and many in this grade cried when told that they would have no garden. I finally told them that they might have a garden if they would bring the materials for fences. The next morning every pupil came to school with one or more bamboos. Even little fellows seven years old brought a long bamboo. The larger boys of the grade built the fence. A corner of the plaza was utilised, and in three weeks every pupil in the school was working in his individual garden. Absolutely every pupil in my district does garden work.

In most cases the teachers have shown great interest in this work. With possibly two or three exceptions, the teachers have carried out my instructions, as the flourishing gardens show.

The parents have shown a creditable amount of interest, often visiting the gardens. In only two cases have I had parents object to their children working in gardens. These objections were easily settled by a little explanation as to the individual ownership of the gardens.

I find that the hardest problems I have had were the stealing of the plants from the gardens and insistence upon frequent waterings. The barrio of Cava being on the main road, and no houses near the gardens, the plants were stolen by people who were passing. I also had considerable trouble in the barrio back in the hills among the "bagos." The barrio of Ambanganon was constantly depleted by thieves. There was also some difficulty in getting teachers to give minute attention to all detailed instructions about the watering of plants.

SUMMARY.

First.—The garden work was done willingly by all pupils.

Second.—Attention was given the gardens on Saturdays and holidays.

Third.—All gardens were owned by the pupils, and the products were the property of the pupils raising them.

Fourth.—Instruction was given in the use of fertilisers, cultivation of plants, use of products, and the saving of seeds.

Fifth.—Garden work was done outside of school hours.

Sixth.—It is believed that the gardens have been a success, and a great benefit to the pupils in teaching them industry, and to the parents and the community at large by the introduction of new food plants.

Seventh.—All that is necessary for a good school garden is plenty of hard work and close supervision on the part of the supervising teacher.

Eighth.—Previous to the starting of our school gardens, radishes, lettuce, beets, endive, carrots, rutabaga, kohl-rabi, turnips, and many other of the plants grown, were unknown as food plants in my district. Now you will find many of these planted at the homes of the pupils.

Ninth.—The only restrictions were that each pupil prepare the soil, cultivate the plants, and save seeds according to instructions. The success of the work I attribute largely to the fact that each pupil was given his own individual plat, thus giving him a definite ownership, and a right to use or sell the products of his garden.

THE SCHOLARS' GARDEN, AND WHAT WAS DONE WITH IT.

By A. C. NEATE (late Melbourne Botanic Gardens).

PART II.

Though the address to, or talk with, the Malvern scholars was given as an extempore narrative, the notes (Parts I. and II.) were retained, so as to be elaborated later in M.S. But the texture of the wording has been somewhat departed from, added to, or varied throughout, so as, perhaps, to be made more helpful in fostering or maintaining a spirit of floral enthusiasm in the minds of all the juniors who heard or will read the same; many of whom, it is hoped, are interested readers of the "Queensland Agricultural Journal"—with special reference to the items treated upon under the "Farm and Garden," with other profitable notes and illustrations in its pages.

It is of interest to the writer to find that the veteran and highly-esteemed Government Botanist, F. Manson Bailey, Esq., F.L.S., is still actively continuing his literary labours, and gives evidence thereof month by month, with illustrations, in the "Queensland Agricultural Journal," under "Contributions to the Flora of Queensland," which will well repay perusal by both young and old, making the lovers of botany and horticulture everywhere his thankful debtors.

Now, for the continuation of these notes, published in the April issue of the Journal:—

"Autumn time is now upon us, with occasional breezes of icy chilliness, and we are rather glad that in the main the fiery sunbeams have been quenched, though we rather regret the lessened floral display occasioned. Let us, however, hear what that hitherto silent, but energetic, brother Frank has to say in continuation of what his sister (Flora) told us previously (pp. 179-181) as to their work, and its results:—

"Our Virginia creeper plants have been much admired, and the foliage, which has been rather scorched by the heat, gave a good deal of rich colouring, and we still have plenty of drooping pieces of the younger leaves; but the best festoonings are on the front of our family home, and we are told they are much admired by passers-by.

"This being the time for chrysanthemums, and we have but a few in our garden, we went with father to see Mr. Pockett's many choice examples in the lovely public gardens (North Malvern). What splendid blooms! some of them fully 6 inches across, and in many variations of colour, all so carefully grown, well-staked, and protected, but so placed that we could stand on the sward quite close to them. My sister and myself hope, in time, to find room for a few very choice varieties in addition to our own, but not so large in the trusses as Mr. Pockett's; smaller flowers suit us best to cut from for the house, or for bouquets to give away.

"We hope in a month's time to have an additional bed ready for, say, roses and chrysanthemums in the main, which father is causing the young

gardener to trench and enrich with decayed leafage, farmyard manure, &c. But, on the whole, we prefer a mixture of various plants, so as to give variety of colour, both as to foliage and blooms, and varying with the seasons. All will, we think, depend on circumstances; but we are always taking mental (or other) notes of the successes of our friends, so as to make, perhaps, helpful improvements to our own little garden.

"It will perhaps interest our 'brothers and sisters,' or, rather, 'cousins,' in Queensland, if we quote a few of the suggestions which Flora and I took count of at the school lecture:—

"1. To take a few visits to interesting groupings of flowers and foliage plants in any local private or public gardens to which we may find it convenient (with permission as to private places) to go on, say, Saturdays or holidays, or after school time on other days. Many of the private gardens here are very tastefully laid out—viz., something after the beautiful Melbourne Botanic Garden style of lawn and parterre insertion; the lawns here being often of buffalo grass, and sometimes of Kentucky blue grass; or, as in the Malvern public gardens, of both kinds intermixed. If we can get father to accompany us on some of our visits, we can be sure to profit more by having his naming of the trees and shrubs, he knowing more than ourselves as to their native countries, habits of growth, suitability for useful positions in either our friends' grounds or for our own smaller opportunities.

"Well, we frequently visit the beautiful Malvern Gardens; they have been but eighteen years in existence, and yet they abound in fine tall examples of well-grown ornamental plants. Many, certainly, are too large for a scholars' garden—say, such as *Brahea filamentosa* (threaded fan palm); *Phoenix canariensis* (Canary Islands' date palm); *Cyperus papyrus* (Bullrush, or paper plant of the Nile, fine tall, and thick clumps in the plant groups); giant and thick, as well as slender-stemmed bamboos; a fine avenue of *Quercus robur* (British oak); a fairly large example of *Q. Lusitanica* (Portugal oak); and near by are some specimens of *Jacaranda mimosæfolia* (Rosewood of Brazil). This last has very fine pinnate leaves, and in summer yields large masses of sky-blue flowers.

"Then there are the rock pools, with very choice examples of *Nymphæas* and *Nelumbiums* (water-lilies), also other water-loving plants, and gold-fish.

"Of course, we visit the roses; they are in good variety, but they had much to contend against last summer from both the 'thrip' and the heat.

"We have the privilege, by invitation, to visit the splendidly-equipped garden of our courteous neighbour in the same avenue, Herr de Chanéet, who, as a well-known professor of music, finds quite royal entertainment for his special 'off' days—viz., Wednesdays and Saturdays, in cultivating a very large and varied collection of roses, climbing, standard, and half-standard specimens. He has fully 500 of these, and over 300 separate kinds, inclusive, and all named. They receive what father calls 'intense' cultivation. The results are marvellous. Belle Siebrecht is one of his best bloomers. Just now others could be named out of this (mainly) tea-scented collection, but *cui bono*?—they must be seen to be enjoyed—with the professor at your elbow!

"Just outside of and opposite to the Malvern Gardens gateway, we saw a fine tall specimen of several years' growth, in a private garden, of the *Musa ensete* (Bruce's Abyssinian banana). Here it stands both the hot winds and frosts very well, being so well protected by its connection with the dwelling, fences, &c.

"2. To visit the Melbourne Botanic Gardens is always a great treat also. Here, our father tells us, are fully 100 acres—(they were commenced in 1846, with 5 acres!). The whole plan, as now paramount, is almost completed by the present director, Mr. W. R. Guilfoyle, who, thirty-four years since, commenced to remodel them. There are now probably over 40 acres of sloping lawns (buffalo grass); classified and promiscuous groupings having been cut

out in the sward, whilst the picturesque features have been largely advanced, as to interconnection of land and water, by the bold and well-planted rockeries, and the effects which have been produced by colouring, with both foliage and flowers, are very apparent. There is one large lake of, say, 14 acres, well studded with islands, all planted, and a new (artificial) lake is now charged with the duty of conserving quantities of water-lilies and other choice aquatic plants.

"One fact alone, our lecturer said, makes these gardens more deeply interesting—viz., that thousands upon thousands of plants are fully labelled with both common and scientific names, native countries, relationships to other plants, &c.; and we intend to repeat our visits there on many future occasions, so far as opportunities admit, though we cannot expect to reproduce either this effect (bold planting) or that contrast (colour or blend), yet we will be sure to annex a fact or so that will both entertain and give us pleasure, enlightening us too when thinking about tending, or otherwise improving, our little Malvern garden.

"The time for visiting other places being, we are sorry to say, for the present, exhausted, we must proceed to give a few added facts which may possibly be of interest to other learners.

"It must not be supposed that we have arrived at perfection—that we pose as possessing a model garden (?) free of weeds and all litter. Oh, no! our imperfections are too apparent; still, we must do the best possible to gradually prepare the soil for the reception of nourishing composts from our heap of decayed leafage and manure, &c. The leaves of deciduous foliage will soon have fallen, the stems of past flowered plants will have to be removed, say, by the end of the month, or soon after that; and the roses may by then be judiciously pruned; then may follow the final digging and trimming up. The lawn of Kentucky blue grass plots, apart from our own garden, are, of course, mown as often as required throughout the seasons.

"We have in our front (home) garden, facing west, and exposed a good deal to the summer afternoon sun, a few—very few—roses. La France is one of the best to stand the blaze of heat, and has been flowering almost all the time for the past six months, and we wish we could quote as our own a plant or so similar to, and in as good a form, as one of a respected neighbour's. What a splendid 'buff,' warmed up with a fine pinky tinge—viz., Catherine Guillot. It stood the sun quite as well as La France, and is a still more magnificent bloomer! We hope, with father's help, to have it budded on to a Banksian climber (we have been promised the buds), and what a splendid effect would be apparent in due time on our veranda pillar! He tells us, though, that for a variable soil like ours that the success would be still more marked had we a similar habited plant of *Rosa fortuneana* to bud it upon, as this free grower stands very well in rather poor, and even gravelly, soil, better than most roses. One of our neighbours has W. A. Richardson growing on this stock. We have this fine rose, but on its own roots, the two Maman Cochet, Saffranot, and some others, including Madame Lambard, *Devoniensis*, dwarf and climbing varieties. As to cuttings of roses, if one wants them to callus and root freely, the best time we find to put them in—as short-jointed examples—is during May or early in June, whilst the ground is still warm.

"Our stock of bulbous and tuberous plants, too, is very limited, and can be counted on the fingers—viz., lilies (*Lilium lancifolium*, *L. auratum*), *Gladioli*, and *Vallota purpurca*, all of which did rather badly in the summer, and will need special nourishment (especially the *L. auratum*). We had fair success last winter with a pretty tuberous plant (*Lachenalia tricolor*), and our new stock of plants are well up, showing their tongue-shaped and spotted leaves, and in a few weeks will give us freely of their golden waxy-yellow and coral-red bell-blossoms, both in the open ground and in a pan or pot for outside the window-sill. These tubers were kept dry all the summer, but asserting

themselves by bursting into growth, were planted two months ago. My sister attends to all the indoor and some of the window plants, but they are of the usual well-known kinds, and I will not name them here, except to say that Queensland is represented in our home by examples of the 'Bird's Nest' fern (*Asplenium nidus*) and 'Elk Horn' fern (*Platynerium alcicorne*), also of a palm lily (*Cordyline terminalis*); the latter is proved specially suited for pots in a young state.

"The advice given in the lecture, and of which we had other evidence, has been adapted to our own little plots, although our 'Home' garden was long since taken in hand on rather similar ideas, viz.:—

"(a) On the north and west sides of the house, with sunny exposure, our father and the rest of us put in here, and retain plants of the Cactus and Aloe family, which last includes that pretty trailing and golden-yellow flowered *Aloe ciliaris*; then Echeverias, Mesembryanthemums in variety, also other fleshy-leaved plants, not forgetting the great variety of bloom we had all the summer given on our rocky edgings and points by the many-coloured Portulacas (*grandiflora*); and they, being only annuals, have ceased to be, but their successors in scores will come up freely after spring begins, to be transplanted at will.

"The perennial Asters (blue-flowered) and *Agathæa cælestes* (blue daisies), also *Cineraria maritima* (Dusty Miller), and *Centaurea argentea* (Silver Leaf), as well as an uncommon—but by no means new—plant of shrubby habit, *Salvia involucrata*, having cheery red florets (coral-like) standing well out from the plant.

"(b) Then, on the shady south and south-west sides we grow hydrangeas (including a fine silvery-leaved kind); five or six good cannas; *Aralia* (*Fatsia*) *papyrifera* (rice-paper plant), with its large palmate leaves; *Arundo Donax* var. (Silvery Bamboo-reed); *Cyperus papyrus* (Nile paper-reed); *Acanthus mollis* (Corinth-column plant)—just below its cast-metal copy on veranda pillar; cowslips, primroses, and fuchsias, ferns, variegated ivy, vinca (variegated perriwinkley), forget-me-nots.

"(c) Generally, as to annuals and small perennials, father prefers us to follow our own experience, but in the main to sow only in the spring time (September), either in the open ground, or, if wanted earlier than that, in boxes set in sheltered positions, proof against extremes of weather. A shelter-house of branchlets (tea-tree) or canvas, or, better, a small greenhouse, or even a glass-topped frame, would aid us very much for seedlings, cuttings, and tender plants in a young state. The next best thing, if early displays are needed, is to do, as we have often done in times past, buy straight off small lots of annual seedlings for spring planting (supplementing our own) from any reliable dealer in plants or from a nurseryman. These notes are penned as giving the experiences of both FLORA and FRANK."

SOOT AND COAL ASHES.

Save all your coal ashes and sift same. They are no use as a fertiliser, but for lightening heavy soils are invaluable.

Let no soot go to waste. Save all you can handle, and place same in a coarse bag, for making liquid manure for chrysanthemums, dahlias, ferns, and any flowering plants. Thrown into a barrel with moist sand, and, worked up together, you get a mixture invaluable for grubs, slugs, and cutworms. Strew the sand and soot around the stems of any thing in seedlings you wish to save.

Market Gardening.

THE FRENCH SYSTEM OF MARKET GARDENING.

A discussion has been going on in England, and many inquiries have been made, about the French or *Maraicher* system of gardening. It originated from a visit paid to a 5-acre farm at Thatcham, in Berkshire, which is one of the few places where the system is being attempted in England. A French gardener had been brought over by the two ladies who set up the farm, in order to demonstrate the great value of the system. A Press representative, who had some conversation with the French gardener, and inspected his garden carefully, writes as follows:—

It is exactly on the model which every horticulturist should have studied, and every traveller will have noticed outside Paris, and there is a good chance that it may be developed in England. An account of the system was given the other day at a small holdings meeting in Berkshire, and as a direct result neighbouring villagers are beginning to follow the French methods.

"Mud, I call this mere mud," said the Frenchman, when complimented on the wonder of his soil. "You should see it in a year. It will be as black as a black hat."

The French garden land is as black and rich as it is painted, and it is brought to its pitch of richness by methods that are within the reach of anyone who is within reach of stable manure. The top spit, or spit and a half, of original soil is taken out and put in heaps. A small portion of it is then mixed with the "shortest" manure, with the sort of thoroughness that a mason mixes his lime and sand.

THREE SIMULTANEOUS CROPS.

This layer of fine rich soil is laid on the top of a level foundation of manure covering the whole acre, half-acre, or whatever it may be. A great part of this surface is covered with glass, either in the shape of bell-jars, known as *cloches*, or lights, which are frames made more economically and much more neatly than you see in England. The frames are at certain periods protected during the night with rye grass mats. In the frames underneath the bell-jars, and in all the uncovered spots between them, the seeds are sown, very often broadcast, and frequently three crops simultaneously.

The succession is quicker than even a skilled English gardener will well believe, and strong plants may be grown astonishingly near one another. The carrots come up before the lettuces are cut, and early greens; carrots and lettuces may all be growing together in one frame.

The Frenchman simply works with the top little bit of soil. No deep digging is required, and the labour is light though continuous. Each year an inch or two of the manure is being converted into mould of such preciousness that a gardener contracts for leave to carry it away—18 inches of it—with him at the end of his tenancy. The heat underneath and the glass above enable the gardener to grow everything before its season, and the economy of space is such that a quarter-acre can bring in a fair living.

WONDERFUL MOULD.

An inch or so of the used-up soil is got rid of each year, but even in its used-up state it would be considered wonderful mould by the ordinary gardener. It is made good, of course, by the addition of stable, not farm-yard, manure.

The French gardener is convinced that even half-acre plots, especially if a number could be co-operatively organised, would pay large sums if in the

neighbourhood of any large town. Cottagers in a village, with a few lights and frames apiece, could also make considerable profit and supply early vegetables, now chiefly purchased from abroad, if their produce were co-operatively collected and marketed.

A visit to a Maraicher farm or a lecture would first be necessary. The French have been perfecting their method for two centuries. The making the soil quite perfect is a question of minute detail, but the first principles may be understood at a glance, and what the French call "the extravagance of perfection" can be got by practice.—"Australian Field."

TO MEASURE MAIZE IN THE BARN, POTATOES IN THE PIT, AND HAY IN THE STACK.

Two cubic feet of good, sound, dry maize will make a bushel of shelled grain. Therefore, to find how much grain is contained in a barnful of husked corn, find the cubic content of the barn, and divide by 2 for the number of bushels of shelled grain.

Suppose the barn to be 30 feet long, 12 feet wide, and 8 feet high, and packed with husked corn.

$$30 \times 12 \times 8 = 2,880 \text{ cubic feet.}$$

Divide by 2, and you get 1,440, the number of bushels of shelled grain in the barn.

In the case of potatoes in a pit, or of hay in a stack, make the same multiplication, and divide by 8 for bushels of potatoes, and by 512 for tons of hay (to the eaves of an oblong stack).

EXPERIMENT PLOTS.

The "American Farmer" says that down in Oklahoma farmers are forming "acre clubs," each member taking 1 acre for an experimental crop, doing his best with it, and, when the season is over, reporting his experience, inclusive of mistakes, and describing his methods. This is the most practical form of agricultural education, and the plan might well be adopted elsewhere. Few farmers are so skilled in agricultural science that they cannot learn something from their associates. The Oklahoma plan is a kind of extension of the experiment station, a reproduction in miniature of the individual farm of the principals governing the stations. It is a most excellent idea, and, if generally carried out, will prove of great educational benefit.

[If the same plan were adopted by the farmer members of Queensland Agricultural Associations, the educational benefit would no doubt be universally recognised.—Ed. "Q.A.J."]

THE CAPE "MORGEN."

Writing on the subject of the cost of destroying prickly pear, in the issue of this Journal for November, 1907, we mentioned the fact that the area of land infested by prickly pear in Cape Colony amounted to 500,000 morgen, and that the Cape farmers reckoned to clear it at a cost of 5s. per morgen. Naturally, Queensland farmers wanted to know the size of the morgen. All we could say was, that this measure of land has varied considerably in extent. A Prussian morgen is equal to 0.631, or something over 3.5th-acre; a Hamburg morgen was 2.38 acres; a Dutch morgen, 2.0076 acres, in Holland. The Dutch introduced the word into South Africa. Since the above was written, we have received a memo. from the Department of Agriculture, Cape Town, office of the Government Entomologist, to the effect that a Cape morgen is reckoned equal to 2.11654 acres. Our correspondent added that 5s. per morgen for destroying prickly pear is an absurd estimate.

Tropical Industries.

COTTON-GROWING.

Towards the end of next month, or even earlier in warm districts, the sowing of the cotton fields should be begun. We have so often pointed out the value of this crop to farmers, that it would seem superfluous to dilate upon the profits to be derived from it any further. That these profits are not imaginary has been proved practically during the past three years, and at a time when this Department undertook to gin the farmers' cotton, and guarantee them a certain price for it, the average yield per acre in money value was £9 all round, some farmers obtaining more, and in two or three cases the seed cotton brought the growers from £12 to £14 per acre, and in one instance the return was £17 per acre. Cotton-growing has its advantages and disadvantages. The advantages are that Uplands cotton is only a six months' crop. Within that time the entire crop should be harvested, and the land prepared for wheat, barley, oats, tobacco, onions, and market garden crops. Once the shrubs have covered the grounds, no further cultivation need, or indeed can, be done without damage to the branches. When the bolls begin to burst, picking may be begun, and a considerable quantity may be gathered in the early part of the season by working only three or four hours a day. In the height of the season all hands must be employed in getting in the crop. It has been stated that cotton should be picked as soon as the boll bursts, but experience has shown that it may remain for several days unpicked, without detriment to its colour or texture. Should, however, heavy rains occur, it is well to get the cotton in as soon as possible. Another advantage is, that cotton-picking is light, easy work, which can be undertaken by boys and girls, who, with a little practice, make excellent pickers, and in a well-grown field they can easily pick from 60 to 80, and up to 100 lb., of cotton in a short day, for which work $\frac{1}{2}$ d. per lb. is paid. It may be said that cotton-picking would interfere with school work. It need not necessarily do so. In the older days of cotton-growing in Queensland, the children attended school as half-timers, and in some districts the school holidays were so arranged that no school time was lost during the year.

In the case of Sea Island and Caravonica cotton, when the crop has been gathered, the plants may be close pruned to within 1 foot or 18 inches of the ground. They will then shoot out very early in the following season, and produce a crop six weeks earlier than if seed had been sown. This pruning may be done for three seasons, after which it is advisable to plough out the old plants and sow afresh. A further advantage connected with cotton is, that when it is picked and left for a few hours in the sun, it may be bagged or baled, and sent to market; unlike maize, which, after it is picked, must be husked, dried, threshed, and winnowed before it is ready for transport. For cotton there is always a certain market. It is impossible to produce too much, at all events, of Uplands—i.e., short-staple cotton. The Manchester cotton spinners use comparatively little Sea Island, but can never get enough Uplands. There is no need for the farmer to look abroad for a market. Every ounce of cotton grown in Queensland can be sold in Brisbane at full market price, Messrs. Kitchen and Sons having erected ample ginning machinery, and the firm is a buyer of any quantity of seed-cotton.

Now, about the disadvantages attending cotton-growing. The most serious disadvantage is the pest known as the boll-worm, which bores holes in the bolls and utterly destroys the fibre. It is the same worm so frequently seen in the heads of maize cobs. The fact of its attacking maize has led to

the use of the latter as a trap crop, and it has been demonstrated that where maize has been planted, between every 25 rows of cotton, in 5 rows consecutively the cotton has been saved, owing to the boll-worms attacking the maize, which was carefully cut and burnt. One row should be planted first with early-maturing sweet maize, and, when the ear-silk appears, careful examination must be made for the eggs of the moth, and when no more fresh eggs are found, the whole plant is cut down, and burnt or fed to stock. Three more rows are then planted, so that the silking time comes on about November. On these large numbers of eggs may be found. These must be allowed to come to maturity, in order to prevent the destruction of their natural enemies, which are parasitic on the eggs and on the worms. The crowded condition of the worms on these ears induces cannibalism to such an extent that few survive. No destruction of this corn is recommended until the whole generation has been parasitised. Then the fifth and last row is planted to catch the eggs of the remaining few, and these are destroyed by burning the ear-silk as soon as laying has apparently ceased.

The opened bolls are often attacked by a very gaudy-looking beetle or bug, but they do not appear to do much injury to the fibre.

I have never seen that cotton pest, known in the United States as the cotton-stainer, in Queensland, although I believe that some kind of beetle has occasionally been found which affects somewhat the colour of the staple. The terrible pest of the cotton fields of the United States of America, the boll weevil, has, fortunately, not made its appearance in Queensland. The Red-banded *Galernca* is, so far, the only beetle responsible for damage to the fibre, but its attacks are infrequent.

The cost of growing a crop of seed-cotton amounts to about £3 16s., including cost of cultivation and picking. A 2,000 lb. crop would thus be produced for about £5 17s. 8d., and the selling price at 1½d. per lb. for Uplands seed-cotton—viz., £12 10s., leaves a profit of £6 17s. 6d. per acre.

Some years ago (in December, 1900) I wrote in the issue of this Journal for that date, as follows:—

The cost of producing an acre of maize is £1 11s. 8d., and with a 40-bushel crop, and maize selling at 2s. 3d. per bushel, the profit is £2 18s. 4d. per acre. The profit on cotton is, therefore, double that on maize.

I also pointed out that the farmer who merely grows his cotton, picks it at ½d. per lb., and sells it to the gin-house owner, makes a profit of £3 2s. 2d. per acre, and if he picks the cotton himself, with the help of his family, he keeps the cost of picking (£2 1s. 8d.) in the family, so that he would actually be getting a profit of £5 3s. 10d.

As I have shown on previous occasions, other nations are preparing to compete with the United States in cotton-growing. Russia is rapidly increasing her acreage under cotton in Asia. Germany is determined to enter upon the industry in her suitable colonies. In what is called "Latin" America—that is, in Mexico, Brazil, the Argentine, Peru, Chili—cotton-growing is spreading.

Here, in Queensland, we have all the conditions needed for a large production, yet we grow wheat in places wholly unsuited to that cereal below the Range, producing in a good season an average of 20 bushels per acre, worth from £2 to £3, from which all the usual expenses have to be deducted. We grow maize, yielding 40 bushels to the acre, worth from £4 to £6, less expenses, often amounting to £2 per acre. And all these lands are capable of producing a crop which will give twice the profit of wheat and maize.

The cotton industry surely deserves a trial once more. Anyone farming from 50 to 100 acres in the Moreton, or any other district below the Range, could spare one or two acres as a trial. If the result prove unsatisfactory,

the loss is not very great, but the lesson gained would be invaluable. On the other hand, if it were successful, it would not be long before the lands now devoted to a few cows and horses in West Moreton, would once again be white with the fleecy crop, and Brisbane, Ipswich, Laidley, and other centres of farming operations would resound with the pleasant hum of the gins."

Over-production is not to be feared.

[Since the above was written it has been abundantly proved that the profit of £6 per acre is, if anything, under-estimated, as shown at the beginning of this article.]

In February, 1908, the imports of American cotton alone amounted to 3,111,667 bales, and although the National Ginners' Association showed a return of 10,593,000 bales, as ginned up to the 7th of that month, this had no appreciable effect on the market prices, which were from $5\frac{1}{3}$ d. to $6\frac{1}{4}$ d. per lb. On 13th February, 1908, Queensland cotton was quoted in London, by Messrs. Slann and Davies, cotton brokers, at $7\frac{1}{4}$ d. per lb. for "good fair" and $7\frac{1}{2}$ d. for "good."

NOTES ON COTTON-PLANTING.

1. Planted 4 feet by 16 inches, there should be 8,034 plants to the acre.
2. Seed should be sown in drills, not deeper than 2 inches.
3. Sow thickly as a safeguard against crickets, which destroy the young plants.
4. If the weather, though moist at time of planting, is not considered moist enough, the seed may be soaked overnight.
5. In rich soil two plants should be left together; in poor soil they should be 18 inches or more apart.
6. Thin out the weakly plants.
7. Keep the ground thoroughly cultivated, and as free as possible from weeds.

PICKING AND PREPARING FOR MARKET.

8. When picking, keep each kind separate, and mark it accordingly.
9. Thoroughly dry the cotton in the sun before baling.
10. The cotton is dry enough to bale when the seed will crack brittle between your teeth.
11. Pick clean and often, but avoid gathering unripe pods.
12. A little moisture in the early morning soon evaporates if the cotton be placed in the sun to dry.
13. A few days of wet weather at the time of ripening is not dangerous to cotton; the subsequent fine weather will set matters right.
14. Each grower should carefully observe the plants when growing, determine the kind best suited to his locality, and in future plantings keep to that kind.
15. If troubled with the boll-worm, mix 1 lb. Paris green with 50 lb. lime, and dust the plants through netting or hessian. When the boll-worm moth is likely to be numerous, plant trap crops as above described.

VALUE OF THE BY-PRODUCTS OF COTTON.

The undecorticated seed is worth from £4 to £6 per ton, whilst decorticated seed is worth from £7 to £8 per ton. The hulls and remaining lint, of which a ton of seed will give about 100 lb., are worth as paper material from £4 to £8 per ton. The refined oil sells at 3s. 4d. per quart in sealed cans. Furthermore, the cotton seed being crushed produces 37 gallons of oil per ton, and cotton-seed oil is worth from £23 to £24 per ton. Again, after the extraction of the oil, we have the oil-cake for cattle food. Oil-cake is worth up to £7 per ton. It will thus be apparent that the by-products of cotton are worth more than the actual lint.

WHAT CAN BE DONE WITH BANANA FIBRE?

In the November (1905) issue of "Tropical Life" we reproduced an article which our editor had written for another journal on the possibility of utilising the fibre in banana stems either for rope or paper making and other purposes. The final summing-up was as follows:—"Five hundred thousand tons of banana stems, calculated to yield 1·80 per cent. of fibre,* is equal to 9,000 tons of fibre, which, taken at only £20 a ton, would give £180,000 in London. Judging by the quotations given below, £20 per ton seems a low valuation.

The great drawback at that time was having to transport 500,000 tons of stems to some central factory, in order to obtain 9,000 tons of fibre. In the January issue of the "Queensland Agricultural Journal," an illustrated description is given of a machine invented and patented by a Tonquin agriculturist, which, if able to do the work claimed for it, could be carried round the banana fields to treat the leaves on the spot. The installation, we are told, consists of three extractors, one slicer, and one pulper, the whole costing about £5 [£10.—Ed. "Q.A.J."], and weighing under 25 lb., and is certainly worthy of attention until something better comes along.

Each machine, it is claimed, will turn out about 65 lb. of clean fibre in a day. When speaking of *each* machine, it would be more correct to describe it as five machines, each of the extractors being worked by a man, whilst a woman and a junior (boy or girl) can work, one the slicer and the other the pulper, the five turning out, as already stated, about 65 lb. of fibre a day between them. The labour bill would, of course, be the chief expense, but the raw material will cost nothing (perhaps even save money in causing a nuisance to be removed). In centres where labour is cheap, the cost of extraction should not be prohibitively high, so whilst the fibre produced should sell for from £20 per ton upwards, according to the quality, a very good profit should accrue to planters in many banana-producing centres.

In a recent issue of the "Bulletin of the Imperial Institute," the director gives very full particulars of seven samples of banana fibres received from British East Africa in 1905, for chemical examination and commercial valuation, the reports on which, as to value, are as follow:—

Sample 1.—Probably from *Musa Livingstoniana*, a fairly lustrous, light-brown fibre, well cleaned and prepared, and of good strength. Fibre mostly 3 feet 5 inches to 4 feet 3 inches, but some shorter, say 2 to 3 feet, valued (in 1905) at £31 to £32 per ton in London. The fibre contained 74·4 per cent. of cellulose.

Sample 2 resembled the preceding in appearance, but rather more lustrous; length, 4 to 5 feet; very strong, soft, very fine, clean, fairly good colour and length; worth from £40 to £42 per ton. The fibre contained 75 per cent. of cellulose. The above were based on the price of Manila at £43 to £57 per ton.

Sample 3.—From 1 foot 9 inches to 3 feet 8 inches long, described as being short, soft, dull-yellowish in colour, and mixed length. Value about £20 to £22 per ton. The fibre contained 71·8 per cent. of cellulose.

Sample A.—Uneven length, 4 to 6 feet. Of a yellowish colour and satisfactory length; rather harsh. The fibre of two lengths—first worth £26, the other £30, per ton. The fibre contained 77·8 per cent. of cellulose.

Sample B.—Of the wild, claret-coloured banana; 5 to 6 feet long; fair colour, good strength, and satisfactory length. (Some parts were stained and weak, and care should be taken that the juice of the plant does not stain the fibre.) Value, £34 to £35 per ton. The fibre contained 71·5 per cent. of cellulose.

* Sir Daniel Morris, in his Cantor Lecture on "Commercial Fibres," at Society of Arts in 1905.

Sample C.—A wild banana, green variety. Tree about three-quarters grown. Fibre 6 to 8 feet long; described as being of excellent quality, well prepared, strong, lustrous, and worth £48 to £50 per ton. The fibre contained 73·4 per cent. of cellulose.

Sample D.—Wild banana, claret variety. Plant about half-grown. Fibre 5 to 6 feet long, carefully prepared, good length, colour, and strength. Value £45 to £46 per ton.

In the opinion of the commercial experts, the samples are comparable with the best fibres used for rope-making; and similar to the most expensive grades of Manila hemp (*M. textilis*), so should meet with a ready sale in London. When exporting such materials, the fibre should be roughly sorted as to length, so that the long may not be lessened by the presence of the shorter, as with sample 1. Two samples of fibre from German East Africa of *M. ensete* showed 78·1 and 74·5 of cellulose on analysis.

In looking at above valuations, planters must, of course, realise that none of these are the usual bananas of commerce—i.e., *M. sapientum* or *M. caven-dishii*; all the same, we strongly recommend every grower of bananas to extract the fibre, to at least send over a sample for report and valuation.

We take the above from "Tropical Life," and would ask our banana-growing readers to consider seriously the loss they annually sustain by allowing the banana stems which have borne fruit to rot on the ground whilst they contain a large quantity of valuable fibre. In the Cairns district the wild banana should afford lucrative employment to many people by the use of the fibre-extracting machine for which Mr. A. Robinson, Civil Service Stores, is agent. Several of these machines have, we are informed, already been purchased for New Guinea and the Solomon Islands.

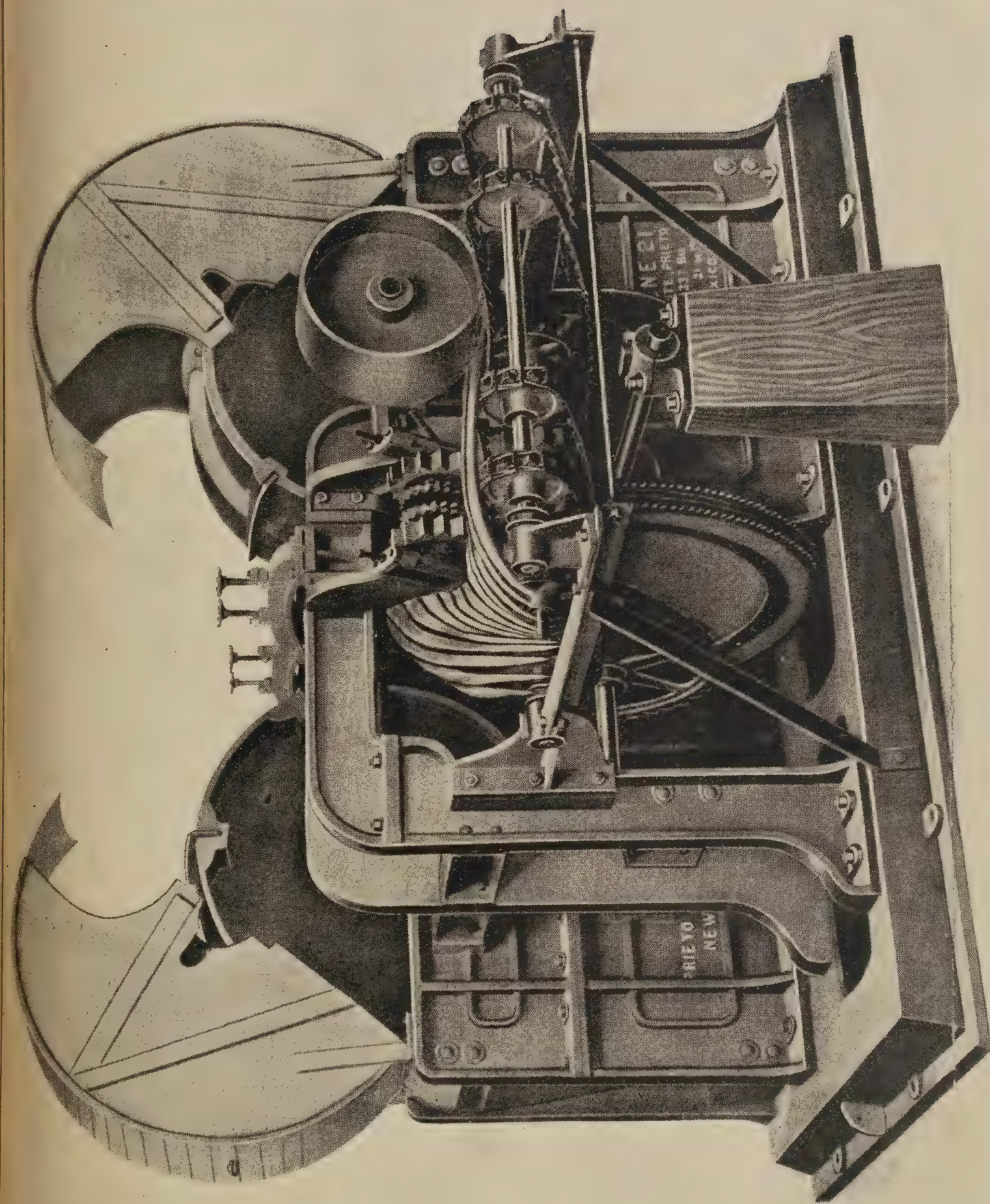
THE PRIETO SISAL-CLEANING MACHINE.

As the time is approaching when larger machinery than is at present in use in Queensland and New Guinea will be required on the older plantations, it is well that planters should have the merits and demerits of the several machines on the market put clearly before them. In the pamphlet on the sisal industry in Queensland, issued in 1906, eight kinds of machines were mentioned as being in use in Yucatan, Hawaii, the Bahamas, and the Mauritius. Amongst these, mention was made of the Prieto machine, the invention of Mr. Manuel Prieto, of New York, but the writer was unable to give any description of it at the time. The requisite information is now furnished us by the Prieto Machine Company (Inc.), 45 Broadway, New York, to whom Mr. Prieto transferred his interests in December, 1905. The machines vary in capacity, power, method of extracting the fibre, engine-power required, and cost. They include the Ideal, double and single drum, the largest being the "Ideal" No. 1, having a capacity of 150,000 leaves per day; the "Irene," single drum, equal to dealing with 30,000 leaves per day; the "Irene," double drum, which can treat 120,000 leaves daily; the "Estrella," a machine for taking the fibre from all kinds of textile plants, with which from 80,000 to 100,000 leaves can be cleaned daily, and various others.

It will be sufficient in this short notice to consider the "Irene" and the "Ideal," the latest improved machines.

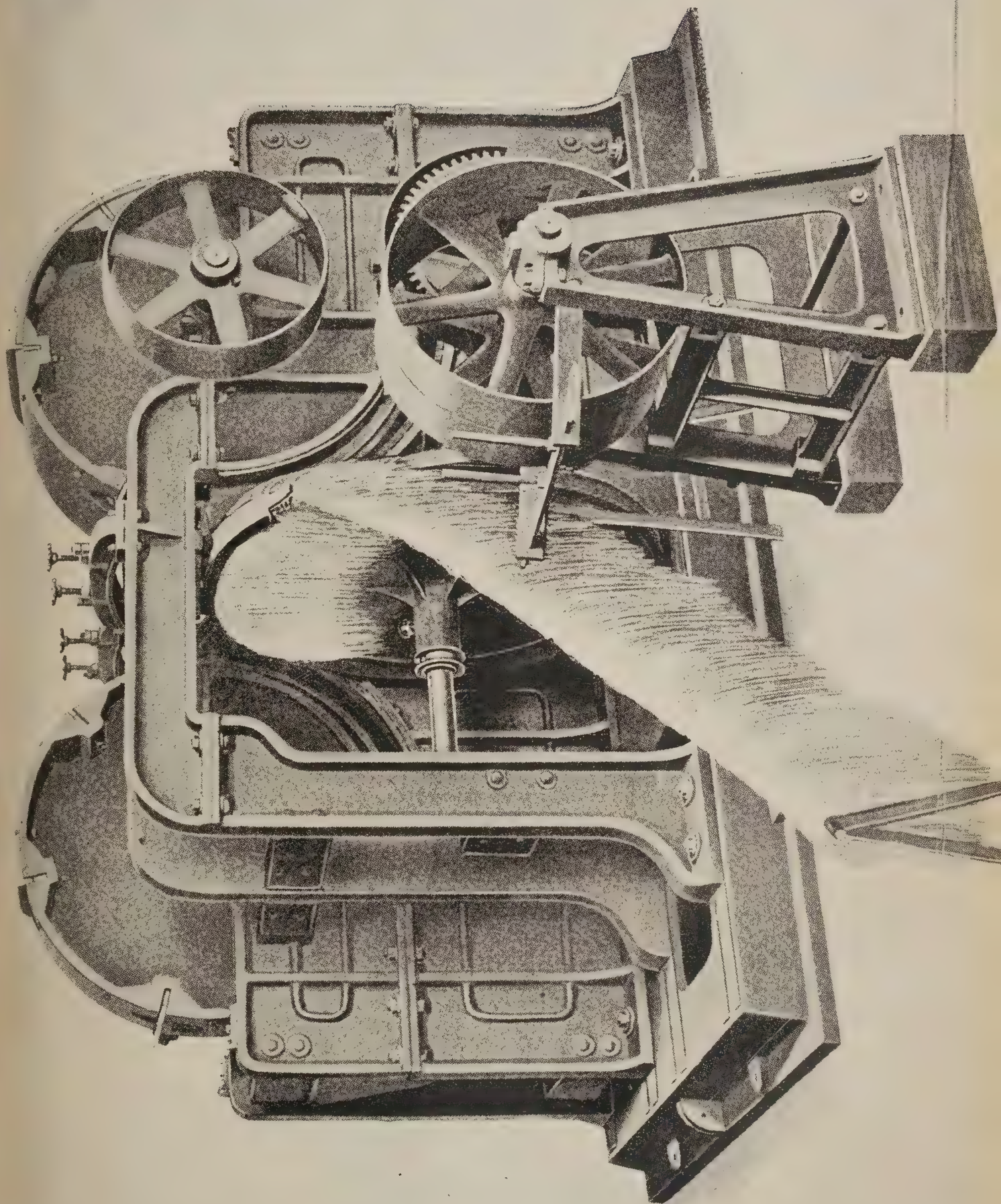
In these, the scraping wheels are heavy, thus ensuring an even run, and overcoming with ease the shocks which extra thick or unevenly-fed leaves give them. In the "Irene" No. 21 the leaves pass from one disc to the other by a special attachment, and run through the machine without the operator having to look after them. All he has to do is to feed the leaves into the machine, and a couple of boys suffice to take away the fibre as it comes from the other side of the machine.

Plate V.



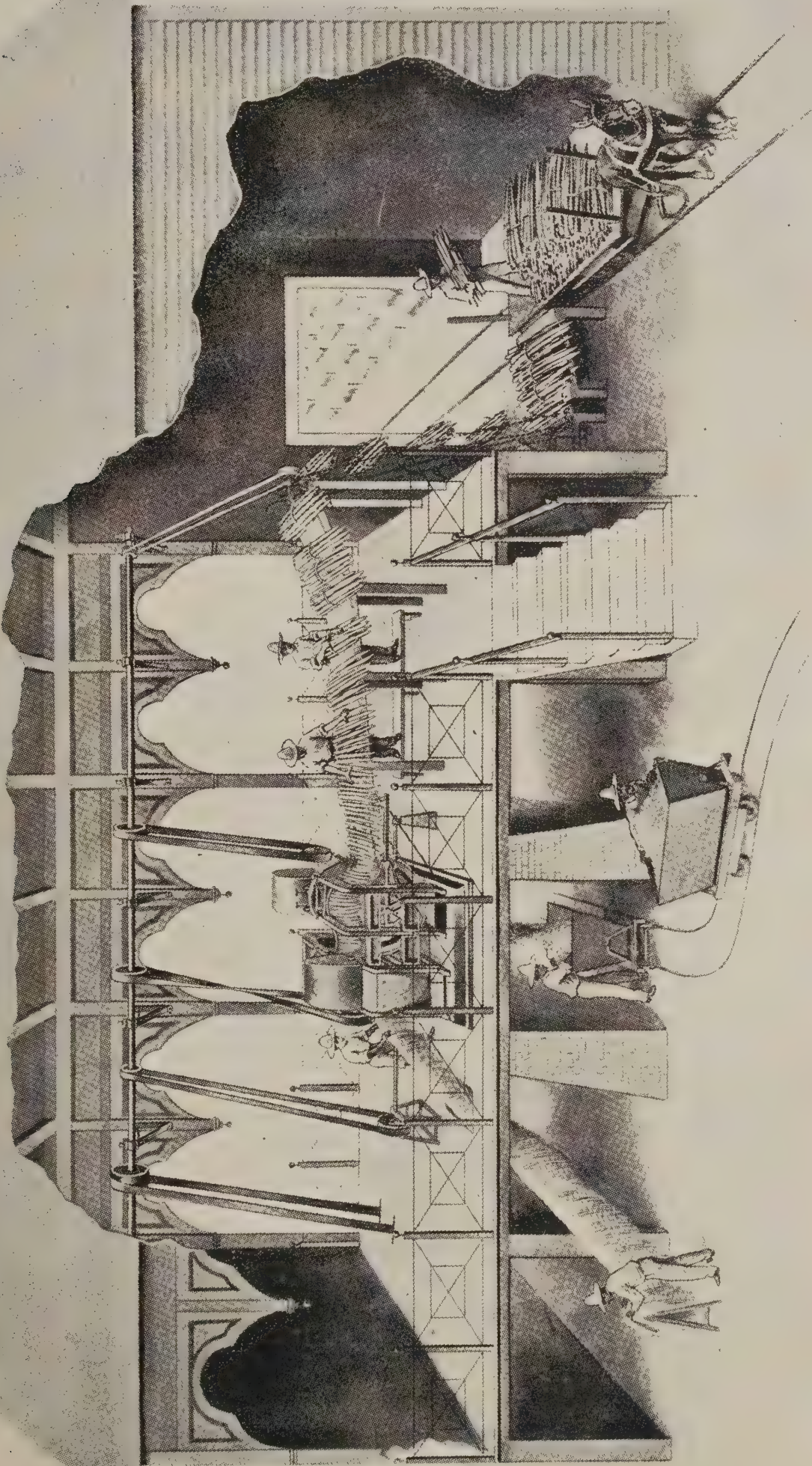
PRIETO FIBRE-CLEANING MACHINE—IRENE NO. 21.

Plate VI.

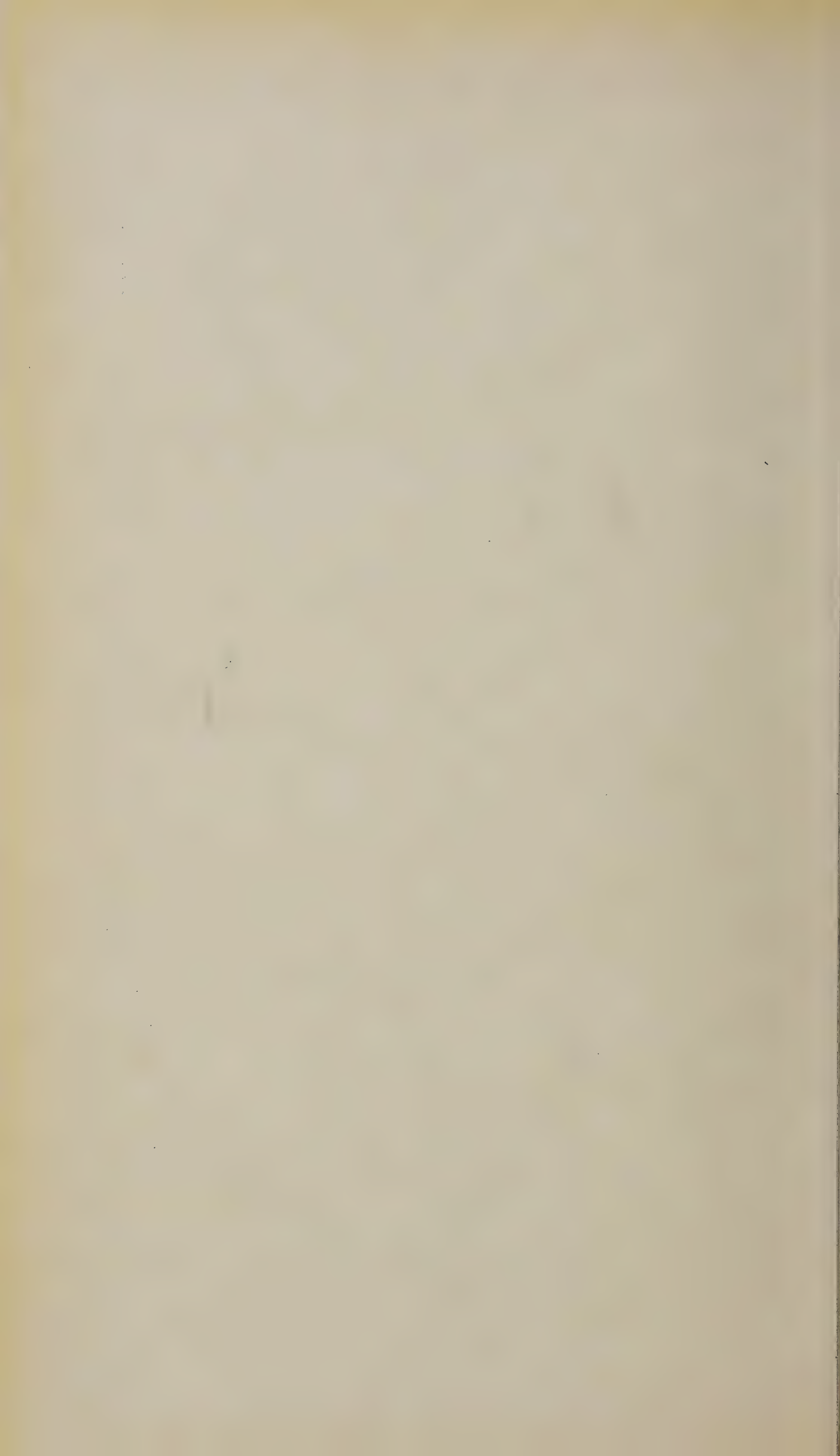


PRIETO FIBRE-CLEANING MACHINE—IRENE No. 21.

Plate VII.



INSTALLATION OF FIBRE-CLEANING MACHINERY, SHOWING THE IRENE 21 AT WORK,





CUTTING AND TRIMMING LEAVES OF THE SISAL PLANT, YUCATAN

Plate IX.



THE SANSEVIERIA INDUSTRY IN UGANDA.



The illustration on another page shows a plant operating in Yucatan, Mexico, where 125,000 to 150,000 leaves are cleaned per day of 10 hours. It is to be recommended that a man should be stationed at the car into which the bagasse is dropped, so that he can watch the work of the machine, and give alarm in case excessive quantity of fibre is discharged with bagasse. The disarrangement of knives, lack of power, or any other accident which cannot be prevented, will immediately be detected by presence of excessive fibre in bagasse.

The leaves can be carried, in the most convenient manner to machine, and be deposited in bundles of 50 leaves on table. The elevator arms will take bundle to top, and drop it on a rather steep incline, where the strings which hold bundle are removed, and the leaves drop on the less inclined table, where they are spread and pushed along until the feed chains which pass leaves into the machine are reached. The machine passes leaves automatically from one disc to the other, and the clean fibre is delivered at the rear end. A piece of wood, similar to the rail of a stairway, is placed near the rear disc, and a boy attends to transferring fibre from the disc to the rail. As this rail is sharply inclined, the fibre slides down to lower floor, where it is received by the men, who take it to the drying-racks.

The prices of the several machines are quoted as follow:—

		\$	£
Estrella	...	2,200·00	= 440
Irene No. 31	...	1,650·00	= 330
Irene No. 21	...	2,750·00	= 550
Ideal No. 1	...	3,800·00	= 760
Ideal No. 2	...	2,750·00	= 550
Ideal No. 12	...	3,800·00	= 760
Irene No. 44	...	1,250·00	= 250

Cost of Belts, Pulleys, Shafts, &c., necessary to set up an installation:—

—	Irene 31.	Irene 21.	Ideal 1.	—
	\$ £	\$ £	\$ £	
Bandas	195·00 = 39	220·00 = 44	250·00 = 50	Belts Pulleys, Shaft, Hangers, &c. Elevator
Poléas, Eje, Estantes, &c.	405·00 = 81	420·00 = 82	455·00 = 91	
Elevador	125·00 = 25	125·00 = 25	125·00 = 25	

We assume that the prices quoted are American currency, the dollar being equal to 4s. 2d. We have given the prices in round numbers, taking 5 dollars to the £1 sterling. The Mexican dollar is worth from 2s. 1d. to 2s. 2½d. It would be a great advantage to enquirers if prices were also given in British currency.

THE “SANSIVIERIA” REGION OF UGANDA.

The “Exporters and Importers’ Journal,” New York, for 22nd February, gives a very graphic account of the Litoral of Equatorial East Africa. That portion of the narrative which deals with the fibre belt is of great interest to planters of Sansivieria in Queensland and Papua. This belt extends from Mukindu to below Voi, at an elevation of 3,500 to 2,000 feet, where, under semi-arid conditions, this indigenous fibre plant covers an area of 5,000 square miles in British East Africa alone, and the same fibre belt stretches right across German East Africa down to the Zambesi. In this belt the average rainfall is 25 inches, yet so dense is the growth of this primeval fibre, that huge pachydermatous wild beasts have difficulty in getting through what are called the “Fibre Islands.”

Of course, the lack of water, and inaccessibility for the present, make a great deal of this area of no commercial value for the time being, but ample developments going on now will bring the whole into line in due course.

The *Sansivierias*, like the "Agaves" of the New World, belong to the great family of *Liliaceæ*. There are many different species, but only five or six are pre-eminently of commercial value, like *S. cylindrica*, *S. sulcata*, *S. ehrenbergii*, *S. volhensi*, and *S. kirkii*.*

Sansivieria belongs commercially to the hard fibres, like Manila, sisal, and jaumauve. It is of a pale cream colour, very pliable, and has been proved, by exhaustive tests, to equal, and even to exceed in tensile strength, the famous Manila fibre as cordage. It also withstands the action of sea-water much better than sisal or hemp. Tests made with it by Admiral Fremantle, of the British slave-cruising squadron on the East Coast, proved it to be the most excellent material for deep-sea sounding lines, and the native fishermen will have no other for their tackle. Sir John Kirk, one of the most noted British administrators there, saw the enormous quantities growing wild in the interior during his extensive travels, and strenuously advocated the commercial exploitation of this promising material at a time when the Philippine hemp supply was ever at hazard by continuous native insurrections under Spanish rule.

Machinery to decorticate the leaves of *Sansivieria* has been the main factor in retarding the development of this particular industry, and it was not until a set of machines, made by the Finigan-Zabriskie Company, of Paterson, New Jersey, U.S.A., was invented, that the difficulty was finally overcome.

On the coast lands the sisal plant does well on the coral outcrops, but better still on the semi-arid "laterite" lands, 100 miles inland, and 2,000 feet above sea-level. There the sisal matures its suckers inside of three years, and the leaves attain an average length of 5 feet and over. At the time when Yucatan sisal fetched 7 cents per lb. ($3\frac{1}{2}$ d.), the East African fibre sold at $10\frac{1}{2}$ cents ($5\frac{1}{4}$ d.).

Unlike the sisal, the *Sansivierias* favour shady localities, under trees and scrub. Their reproductive properties are truly marvellous. Any old piece of root or stalk will throw out roots, and grow into a new plant. One may take a piece of stalk, stick it into the ground, and let it take root, and tear it up and plant it again, and repeat the process several times, and it will still come up smiling, and all this without having been watered or tended. Neither locusts nor cattle nor pigs will touch the stalks.

NEGLECTED INDUSTRIES.

CASSAVA.

Nine staple field crops are produced in Queensland. These are sugar, cereals (wheat, barley, oats, maize, &c.), potatoes, onions, and lucerne. There are several minor crops produced, but we take the above as those most generally grown by farmers throughout the State. Amongst the neglected crops may be reckoned cotton, coffee, rice, cassava, rubber, sisal hemp, cocoanuts, castor oil, and a few others, for which the soil and climate are admirably adapted, and which offer a prospect of good returns. It may be conceded that cotton, sisal hemp, and rubber are at last engaging the serious attention of farmers, but it will be some years before the two latter products will become largely exported, except in two or three cases where the plantations of sisal are somewhat extensive.

* No mention is made here of *S. Zeylanica* or *S. Guineensis*, both of which yield a readily marketable fibre, which has been produced in Queensland, and valued in the United Kingdom and Germany at from £35 to £40 per ton.—Ed. "Q.A.J."

In this article we will consider the prospects of Cassava. This is the *Manihot*, or *Manioc*, so largely cultivated in the Brazils and in the West Indies as a food-product for man and beast. The plant, which much resembles the castor oil plant, is of two kinds, the sweet and the bitter (referring to the tubers). The tubers of the bitter Cassava are exceedingly poisonous, but the poison is entirely confined to the juice. When this is expressed, the pulp is perfectly harmless. Furthermore, the poison is so volatile that the tubers, when sliced and exposed to the hot sun, may be fed to cattle without any ill effects. Singular to say, the juice may be boiled with meat, and eaten without danger. In Brazil and in the West Indies a kind of soup is made with it, called "Cassareep," and Cassareep is the foundation of the celebrated West Indian "Pepper-pot," a recipe for which delicacy appeared in the last number (May) of this Journal.

The tuber of the Sweet Cassava is harmless, although it, also, contains a trace of poison, but the writer has often taken a small tuber from the ground and eaten it raw, as one might eat a carrot, turnip, or sweet potato.

There is no more difficulty in cultivating Cassava than in growing maize or sweet potatoes, and it is infinitely less troublesome to produce than sugar-cane, coffee, or cotton. It is enormously productive, one acre of Cassava being equal in food value to 6 acres of wheat.

Writing on this subject, the "Indian Trade Journal" says:—

The results of the tests of twenty-one natives varieties of Cassava at the Hope Experiment Station, Jamaica, indicate that under the conditions of a moderate rainfall and a friable soil, very large yields of tubers are obtainable. At twelve months a maximum yield of $10\frac{1}{2}$ tons, rising to $15\frac{1}{2}$ tons at fifteen months, and of nearly 22 tons of tubers per acre at twenty-one months, has been recorded.

The indicated yield of starch per acre rose from $3\frac{1}{2}$ tons at twelve months to $5\frac{1}{2}$ tons at fifteen months, and over 7 tons of starch per acre at twenty-one months' growth in these trials. As a starch producer the Cassava should therefore take the highest place among the economic plants of the world.

MATURATION AND VARIETIES.

Of the twenty-one local varieties of Cassava tested in the experiments, two or three stood out as particularly prolific. Experience of Cassava varieties grown in Jamaica points very strongly to the necessity of planters testing all the best kinds themselves, as the greatest variations appear to exist in the behaviour of the same variety of Cassava under different conditions of soil and climate.

It is necessary to secure perfect drainage in the soil zone in which the tubers are produced, and to avoid the serious mistake of planting Cassava on stiff soil on the flat, without any drainage at all. Serious losses of tubers have already occurred on some large cultivations through the neglect of this first principle of Cassava cultivation. At Hope, the best variety for harvesting at twelve months' growth was found in the local Cassava grown in the district, and known as "White top." This gave $10\frac{1}{2}$ tons of tubers, containing nearly 4 tons of starch, per acre.

It would appear that in Jamaica a long period of growth is the most economical basis for Cassava cultivation, and that quick returns and early maturing varieties do not afford such a prospect of profit as the larger yields of varieties of longer growth. The variety "long leaf blue bud" was found superior to the "white top" when allowed to grow for fifteen months, yielding 15 tons of tubers, containing 5 tons of starch, per acre, while at twenty-one months' growth the lead was taken by "blue top," which gave the enormous return of 21.9 tons of tubers, containing over 7 tons of starch, per acre.

COST OF PRODUCTION OF TUBERS.

The cost of growing Cassava on a large scale in Jamaica has been studied by Messrs. J. W. Middleton, Joseph Shore, the Hon. H. Cork, the Hon. J. V. Calder, and at the Hope Experiment Station. It has been deduced from the figures put forward that Cassava should cost, for cultivation only, from £3 13s. to £5 per acre, according to locality and circumstances. The lower price represents the estimated cost under the most favourable conditions of broad-scale implemental culture on friable soils, while the higher price would be the cost of Cassava farming on rocky land by hand labour. An average cost of £4 per acre represents the estimated cost under favourable conditions of estate cultivation. The Hon. Henry Cork has estimated that a capital of £1,600 to £2,000 would be required for starting a cultivation of 100 acres of Cassava on new land. Allowing 10 per cent. on capital and 20 per cent. on live and dead stock account, Mr. Cork's estimate sets the actual cost of such a cultivation at £6 to £8 per acre. With regard to the yield of tubers to be expected, it would appear that an 8-ton crop should be a fair average, while good lands with efficient tillage should return 10 tons and more per acre. These figures indicate that Cassava can be grown in Jamaica at less than £1 per ton.

MANUFACTURE.

Much has still to be worked out as to the most efficient plan for dealing with the Cassava grown in Jamaica, for the manufacture of starch, cassareep, and cattle food. The first process is that of washing and decorticating the tubers. For this purpose the simple machine recently devised by the Hon. T. H. Sharp appears to be entirely satisfactory. The great cost of peeling tubers by hand in the early experiments is thus entirely avoided, and the tubers are automatically washed and delivered free of the cortex by the operations of this machine. This invention has solved one of the outstanding difficulties that faced the starch producer in Jamaica. To secure an efficient recovery of starch, the finest possible disintegration of the cut tissues of the Cassava is necessary. There are mills now obtainable that give excellent results, and produce a very fine disintegration at a high rate of production. A second grinding or disintegration should be carried out where starch is the main object of manufacture, but where a good market can be found for the dried residue as a cattle food, the second milling may probably be disregarded. The sieving, purification, settling, refining, and drying of the starch seem all to be capable of easy accomplishment with suitable machinery, and there is now no doubt at all that a starch factory, to produce 1,000 tons of starch a year, could be erected with every certainty of producing a high grade of Cassava starch. Such a factory should not cost more than £6,000 or £7,000 to erect, and, with intelligent management, a satisfactory result should be assured.

COMMERCIAL VALUE OF CASSAVA STARCH.

It would appear that a well-made Cassava starch is worth £14 to £16 per ton in the English market. At such prices as these there is a liberal margin of profit. The "bitty," when dried, is a valuable cattle food. A sample from the Longville factory was found to contain 65·7 per cent. of carbo-hydrates, on basis of 15 per cent. of moisture, and should find a ready sale at £2 10s. to £3 per ton. A planter from Dominica recently stated that he had found a good market for cassareep in England, and it is possible that this article may become a useful by-product in the manufacture of Cassava starch.

Although Cassava has been grown in Jamaica from the earliest days of which any record is obtainable, it is only recently that its commanding merits, as a source of high-class starch, have attracted the attention of practical men.

It is now admitted that Cassava starch has certain qualities that make it of exceptional utility in the dressing of cotton goods, and there is also reason to believe that the quality of the Cassava starch produced in Jamaica is superior to that obtained from the same plant grown in the East Indies.

CULTIVATION.

Now, a few words about the planting and cultivation of Cassava in Queensland. The best land for its successful cultivation is a loose, dry, well-drained sandy loam of considerable depth. Heavy land, with a clay subsoil, are to be avoided. When the land has been properly prepared, make cuttings of the stem of the plant about 6 to 8 inches long from the mature wood, and lay them horizontally in the furrow, as in the case of sugar-cane. In a fortnight from planting they will begin to shoot. Keep the ground clean until the plants are high enough to cover the ground, and in eight months after planting the tubers will be ready to dig.

There is no need to dig the whole crop at once. The tubers may be left a whole year in the ground after they are ready for use, and will improve in that time rather than deteriorate.

The plant thrives best near the sea, or inland within the influence of the sea-breeze. It does not require much moisture, except in the early stage of its growth, as too much humidity causes the roots to decay and perish.

Statistics.

COMMONWEALTH METEOROLOGY.
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1907.								1908.				
	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.
<i>North.</i>													
Bowen	3.46	2.87	Nil	1.28	0.51	0.06	3.71	6.39	10.14	5.63	9.46	3.73	0.99
Cairns	8.65	4.45	0.12	0.39	1.35	0.63	5.35	28.33	27.02	8.03	20.60	5.99	3.05
Geraldton	21.91	8.54	2.39	4.66	1.36	1.42	6.45	33.82	44.39	13.27	39.00	14.23	18.52
Herberton	1.57	2.71	Nil	0.11	0.12	0.17	3.41	9.57	9.29	5.02	8.92	1.40	0.38
Hughenden	1.34	0.95	1.16	Nil	Nil	1.66	0.66	7.75	0.98	5.18	6.91	0.30	...
Kamerunga State Nurs.	9.33	5.29	0.13	1.15	1.19	0.53	2.76	29.82	...	7.47	25.75	4.60	3.363
Mackay	6.09	5.04	0.27	0.25	0.12	0.12	5.76	9.70	9.28	3.83	17.43	14.82	3.25
Rockhampton	0.94	4.16	0.84	0.47	Nil	0.47	3.72	4.42	3.84	9.64	9.77	2.62	0.85
Townsville	3.11	2.38	Nil	0.07	0.14	0.03	2.82	24.26	12.21	6.69	9.03	0.38	2.22
<i>South.</i>													
Biggenden State Farm	4.02	5.24	1.51	0.96	0.24	1.99	2.50	5.55	2.37	9.82	9.84	2.97	0.74
Brisbane	4.75	2.91	0.39	0.79	0.10	1.37	4.25	3.21	2.80	8.43	18.19	2.45	2.40
Bundaberg	3.08	4.49	0.87	0.43	Nil	1.70	2.90	2.99	4.77	2.82	7.35	4.13	0.67
Dalby	2.26	2.35	0.87	0.71	0.15	0.69	5.18	1.44	0.17	4.88	7.61	0.11	0.37
Esk	5.42	2.66	0.54	0.81	0.57	0.50	3.76	3.72	2.61	10.06	17.04	2.83	1.07
Gatton Agric. College	2.80	1.85	0.54	0.56	0.15	0.71	3.01	4.55	...	3.38	10.74	...	0.10
Gindie State Farm ...	Nil	2.29	1.58	0.10	0.16	0.61	1.57	4.42	0.20	7.17	6.25	0.02	0.112
Gympie	3.84	3.77	0.80	0.17	0.47	1.20	3.05	5.49	6.26	11.77	80.8	1.87	2.00
Ipswich	3.43	2.22	0.30	0.43	0.05	0.78	4.45	3.40	1.32	6.63	13.77	2.71	1.14
Maryborough	3.21	6.05	0.64	0.93	0.25	2.74	3.49	5.81	5.62	8.07	11.40	2.52	1.05
Roma	0.27	2.47	1.03	0.42	0.04	1.04	3.70	2.51	0.04	6.38	2.51	0.22	...
Tewantin	7.16	7.61	1.48	0.95	0.55	1.05	3.12	7.36	10.42	12.47	14.39	7.59	8.66
Warwick	1.58	1.27	1.16	1.37	0.01	1.37	3.25	3.13	0.76	4.52	6.65	1.40	0.15
Westbrook State Farm	2.53	2.53	1.04	1.78	Nil	1.08	4.76	3.23	0.43	8.03	1.41	1.40	0.05
Yandina	4.83	6.98	1.15	0.68	0.80	1.44	2.87	3.05	...	...	16.62	5.45	4.59

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered approximate only.

GEORGE G. BOND,
Divisional Officer.

Science.

ELECTROLYSIS IN REINFORCED CONCRETE.

The apparent advantages of reinforced concrete for building silos over timber or iron have been so amply demonstrated that it is probable many of these useful structures will be constructed of this material. One of the strongest recommendations for its use as a protective envelope for steel or iron structures is the fact, or we should say, the belief, that concrete effectually prevents the corrosion of the imbedded material. Recently, however, a writer in "Art, Trade, and Industry," has raised, or rather revived, the question as to whether, under certain conditions, the steel of reinforced concrete may not be subject to the destructive effects of electrolysis. The revival of interest is due to some experiments recently made by Mr. A. A. Knudson, of New York, and reported a few weeks ago to the American Institute of Electrical Engineers. The experiments were carried out as follow:—Some blocks of 1 to 1 Portland cement sand concrete were moulded in a common metal water-pail, with a piece of 2-inch wrought-iron pipe placed vertically within the blocks to a depth of about 8 inches. When the blocks were three years old, one of them was placed in a tank of sea water, and another in a tank of fresh water, with direct current to feed to the iron pipes in the centre of each block, the negative electrode consisting of a piece of sheet iron placed in the tank. A third block, similar to the other two, was placed in a tank of sea water, but was not subjected to the electric current. After a period of thirty days the last-named block was found to be in perfect condition and the imbedded pipe was perfectly right. But the other two blocks, which had developed cracks during the test, were easily broken open; yellowish deposits were found in the cracks where the concrete had deteriorated to such a degree that it could be easily cut with a knife, and the pipes were considerably corroded, showing a loss of weight of over 2 per cent. Similar results were obtained in tests with blocks of standard Rosendale cement, made in the same mould, although in this case the blocks were tested thirty days after they had been made. The cracking of the concrete appeared as early as the sixth day of the test, and by the eighteenth day they looked as though they might fall apart. One of the pipes showed a corrosion similar to the pitting action of underground electrolysis, a hole $\frac{3}{8}$ by 1 inch being formed through the wall of the pipe.

It cannot be denied that these results are of profound significance. They call for careful investigation on the part of concrete engineers, and the provision of special means of insulation in all cases where imbedded structural steel, of the reinforcing material of armoured concrete, is liable to attack by stray currents in the neighbourhood of wet foundations. The whole subject of electrolysis which, because of the exaggerated use to which it has been put by a sensational Press, has not received from technical men the attention which it deserves, should be made the subject of a searching investigation, with a view to determining the laws and limits of this form of corrosion. The existence of a valuable building material is menaced, and the preventive is simple.

Commenting upon the above, Mr. A. Morry, surveyor, Department of Agriculture and Stock, who is a specialist in the construction of concrete silos, says that the conditions in all concrete structures are quite different to those in the blocks tested. Metal work in structures of this class is *never* brought in direct contact with the earth, and in the case of silos especially, no such electrolytic action could possibly result.

Animal Pathology.

REPORT ON METHODS ADOPTED FOR THE ERADICATION OF CATTLE TICKS IN THE UNITED STATES OF AMERICA.

By SYDNEY DODD, F.R.C.V.S.,

Principal Veterinary Surgeon and Bacteriologist to the Queensland Department of Agriculture and Stock.

No official reports covering a later period than the above are to be obtained, but, through the kindness of Dr. Kierhan, who has charge of the work in North Carolina and Virginia, I am able to give a summary of the work done in those States up to the end of 1907.

TICK ERADICATION.

Area, Square Miles.	Total No. of Herds.	Total No. of Cattle.	No. of Herds Infested at First Inspection.	No. of Infested Cattle at First Inspection.	No. of Infested Herds, 1st September, 1907.	No. of Infested Cattle, 1st September, 1907.
VIRGINIA.						
10,297	24,740	106,750	1,991	10,498	652	3,751
NORTH CAROLINA.						
10,364	24,752	100,350	2,398	10,737	463	1,907

The cost of the work of eradicating the cattle tick varies a good deal in different States, but at present the actual figures are unobtainable. In North Carolina, in 1906, it cost about 15 dollars (£3) per day for each inspector, and the number of cattle treated (oiling, &c.) varied from 7 to 15 head daily. (In this State a good deal of the actual work of oiling the cattle is done by the inspectors instead of their merely acting as advisers.)

In Carolina, Georgia, and Virginia it is estimated to cost about 20 cents (10d.) per head of cattle for the preliminary inspection. Of the measures adopted by the United States Bureau of Animal Industry for eradicating ticks from cattle in the infested districts, the following are the chief:—Details are given in the various bulletins issued to farmers by the Bureau of Animal Industry: (1) Picking or brushing them off; (2) Smearing or spraying cattle with crude petroleum oil or an emulsion; (3) Dipping in a vat with crude oil or an emulsion.

1.—PICKING OR BRUSHING THE TICKS OFF CATTLE.

This method is applicable where the herd is small; the ticks being picked off the cattle by hand, or scraped off with a blunt knife or curry-comb. It is a laborious method, and needs to be done at least three times a week so as to find all the ticks before they mature and drop off. Of course, no fresh-infested cattle or equines are allowed to be brought on the premises, nor hay from infested pastures.

2.—SMEARING OR SPRAYING CATTLE WITH OIL.

It is asserted by the United States authorities that crude petroleum oil, or that known as Beaumont crude oil, is efficacious, not only freeing cattle from ticks, but that it will prevent ticks from getting on cattle for a short period. The cattle to be treated are covered entirely with the oil, which is either applied by hand by means of a brush or piece of cloth, or the animals are sprayed with an ordinary spray pump. In some parts an emulsion of the oil is used, made up with crude oil, soap, and soft water. In oiling cattle the greatest trouble experienced is to get the owner to apply the oil thoroughly, for, if it is to be of any use at all, no part of the animal must be left untouched.

3.—DIPPING IN A VAT.

Here, again, crude Beaumont oil is used. This method is adopted on the large ranches where the foregoing methods are not applicable. This oil is said to be superior to any other of the dips tried for destroying ticks. The light crude oils are said to be better than the heavy ones, as the latter injure the cattle when dipped in them. At first it was thought that an oil heavily charged with sulphur was essential, but I am informed that experiments appear to indicate that sulphur does not play such an important rôle in destroying the ticks as was thought.

The Bureau recommends an oil with 40 per cent. of its bulk having a boiling point between 200 degrees and 300 degrees C., with a specific gravity between $22\frac{1}{2}$ degrees and $24\frac{1}{2}$ degrees Béaumé, and containing $1\frac{1}{4}$ to $1\frac{1}{2}$ per cent. of sulphur. I have obtained analyses of three samples of Beaumont crude oil which were used for dipping cattle. All three are said to have been equally of use in destroying ticks, but one was found to injure the cattle, whilst the others were harmless.

The analyses are here given:—

Beaumont Oil, No. 1.

Gravity Bé. ... 24 degrees.

Distillation of 100 c.c.

150 degrees and below	... 1.65 per cent.
150 degrees to 180 degrees...	0.95 per cent.
180 degrees to 210 degrees...	7.75 per cent.
210 degrees to 240 degrees...	10.0 per cent.
240 degrees to 270 degrees...	13.0 per cent.
270 degrees to 300 degrees...	10.50 per cent.

43.85 per cent. below 300 degrees C.

Flash point, 51 degrees C. or 122 degrees Fahr.

Sulphur, 1.25 per cent.

Beaumont Oil, No. 2.

Gravity Bé. ... 22 degrees.

Distillation, 50 c.c.

150 degrees and below	... 2.50 per cent.
150 degrees to 180 degrees...	1.00 per cent.
180 degrees to 210 degrees...	7.00 per cent.
210 degrees to 240 degrees...	10.80 per cent.
240 degrees to 270 degrees...	13.00 per cent.
270 degrees to 300 degrees...	10.40 per cent.

44.70 per cent. below 300 degrees C.

Flash point, 60.6 degrees C. or 140 Fahr.

Sulphur, 1.51 per cent.

Beaumont Oil, No. 3.

Oil which Injured Cattle.

Gravity Bé. ... 21.5 degrees.

Oils Distilling below 300 Degrees.

215 degrees to 240 degrees	... 10.0 per cent.
240 degrees to 270 degrees	... 17.8 per cent.
270 degrees to 300 degrees	... 12.8 per cent.

40.6 per cent. between 215 degrees
and 300 degrees.

Moisture	... 14
Sulphur	... 0.58

Other oils from wells in different parts of America are used in various parts, but not, as far as I can gather, with such success as the Beaumont oil.

The conditions under which the oil should be applied to animals, in order that a minimum amount of risk may be run, are:—

- (1) The animals should be rested for at least five days after treatment.
- (2) They should be provided with shelter from the sun.
- (3) They should have access to plenty of good drinking water.
- (4) Extreme heat or cold should be avoided.
- (5) Wet weather will result in a lot of the oil being washed off, and hence its full effect will not be seen.

If these precautions are not observed, fatalities may occur, and even sometimes under favourable conditions burning of the skin takes place, at times very severely.

Another plan for freeing cattle from ticks, known as the "Soiling" method, was first suggested by Curtice, and is based upon a knowledge of the life history of the cattle tick. The time elapsing between the dropping of the mature female tick and the hatching of its eggs is rarely less than three weeks, and the time spent by the tick upon an animal from the period of its attaching itself to the time of the dropping off is usually from twenty to forty-five days. When the tick-infested cattle are to be cleaned, as is necessary before they are put on uninfested pastures, it is recommended that the cattle be kept in a tick-free paddock for three weeks, when many of the ticks will have fallen off. They should then be moved into a similar paddock for another three weeks, and, if necessary, into a third enclosure to make quite sure that all ticks have dropped off, when they can be put on to the clean pasture. It will be observed that the cattle do not stay long enough in any one paddock to allow of fresh ticks hatching and reinfesting animals. Of course, these pens cannot be used repeatedly until they have been rendered free from ticks, and any hay fed to the animals must be from tick-free pastures.

Methods Adopted for Freeing Pastures from Ticks.

These, again, are based upon a knowledge of the life history of the tick.

One method is to exclude all cattle, horses, mules, and donkeys from the pasture for a definite period, and so starve out the tick. This may be accomplished by simply dividing the ground into two parts by a double fence. One part is kept free from cattle or equines for a certain period, then the cattle are cleaned from ticks by one of the foregoing methods, and turned into the vacant part, which is now tick free. The other part is cleaned in the same way.

Another way for destroying ticks on pastures is to cultivate the soil for a year without permitting any ticky cattle, horses, or mules on the ground.

A third method, recommended by the department for pastures that are too large to be cleaned in the above ways, is to burn off the grass in the spring or autumn, and then keeping tick-infested animals off the land. This method, although useful as an aid in cleaning the ground, is unreliable in itself, as one may come across patches of grass or bare ground which have escaped the fire, and any ticks which may be on these patches will escape.

The "Feed lot" method. The plan here is to take a field, which has been sown with corn, millet, or any other forage, and fence off from it three parts. (This plan is recommended for the purpose of freeing cattle and pastures at the same time.) As in the "Soiling" method, the cattle are moved every three weeks. The cattle after passing through the three parts are then tick free, and are put into the remaining part of the field. In the next year, the cattle may be turned into the regular pastures which have remained vacant, and have also become tick free.

The remaining method is that of pasture rotation. Here, again, the field is divided into two parts by a double fence 10 feet apart, to prevent the ticks migrating from one field to another. Cattle are removed from one part to the

other, and the first remains vacant for a certain time. The cattle are then moved at intervals of three weeks to three different tick-free, cultivated fields. When the ticks have died out of the original pasture, the cattle which are now clean are put back again.

As the main object at present in the United States is to place the quarantine line further south, the plan adopted by the authorities in mapping out the sphere of operations for the season is to take the existing quarantine line as one boundary, and then fix a new boundary line running roughly in a circle, so as to enclose an area of tick-infested country. The size of this area depends upon—(1) The nature of the country; (2) the amount of money the department has to spend upon the work, which naturally determines the number of inspectors who can be employed; and (3) the number of herds and cattle in the enclosed area. Where possible, natural boundaries are preferred to artificial ones. As before mentioned, it is also ascertained whether the State concerned has efficient laws to prevent owners allowing their ticky cattle to stray on public lands or roads, and to enable infringements of the law to be punished.

After the area in which tick eradication is to be carried on is defined, it is placed in quarantine, notice defining the new boundaries being published in the local newspapers, and posted upon court houses and on all the roads leading into the newly-quarantined area. In fact, the utmost publicity is given to the regulations. By this order, all movement of cattle from tick-infested districts into or out of the proclaimed area is totally prohibited. This area, which is under the charge of a veterinary inspector, is then divided up into sections; each section is placed in charge of a subordinate veterinary inspector, and, under their supervision, stock inspectors make a farm-to-farm survey of the section. Their preliminary duty is to make a record of the number of farms infested and non-infested with ticks; the number and description of cattle on the farm, and also how many are tick infested, and how many are free; also a number of other details are observed. The system of dealing with infested and non-infested cattle or land appears to vary to some extent in various States, but the general rule appears to be that, if on inspection a farm is found tick infested, the farmer is served with a quarantine notice to the effect that his cattle are infested with ticks, and he is, therefore, forbidden to move or allow to be moved any cattle to or from his premises, and he is directed to free them from the tick by either of the methods recommended by the inspector.

During the survey the various methods for getting rid of the tick are explained to the farmer by the inspector, and he also suggests what method would be most suitable in that particular case. A record is kept of whatever method the cattle-owner decides to adopt. If the farmer is indifferent or refuses to take any steps in the matter, his premises are simply kept closed against any movement.

In some States, however, the law provides that where an owner refuses to carry out the process of disinfection it may be done by the local authorities, and the cost recovered from the owner by selling his cattle. Infractions of the law, whether deliberate or accidental, are punished.

In about twenty-one days after the first visit, not longer, a second inspector visits the various farms, to see whether the work is being carried out properly or at all. If not, the practice is now to try to persuade the farmer to start at once, and even to assist him by showing him how to proceed. Other visits are made every three weeks to see whether the cattle have picked up fresh ticks or whether the work is still being done. If nothing has been done, stronger pressure is applied at each visit.

The veterinary inspector in charge of the section is responsible for inspecting farms when the work is finished, and certifying whether they are free from ticks or not. If the inspector is satisfied, the quarantine area is declared free, the northern or old quarantine line is thrown open, and the southern boundary then becomes the northern one. As a result, the cattle in this newly-released

area have unrestricted access to the northern markets, with all the benefits which this entails. The next season a new area is enclosed, and the work goes on as before.

Records of work done are kept by the veterinary surgeon in charge of the district, and also by the chief office at Washington, so that it is always possible to note whether the work is being carried out properly, or whether any farm or herd has been missed.

The following is a statement of inspection work up to 31st October, 1906, taken from a report issued by the Bureau of Animal Industry in 1907:—

State.				No. of Federal Veterinary Inspectors Employed.	INSPECTIONS.					Number of Counties.
					Herds.	Cattle.				
						Free.	Infested.	Total.		
Alabama	...	...	...	3	780	4	5,550	5,554	2	
Arkansas	...	...	...	3	1,527	6,671	2,328	9,003	2	
California	...	...	...	9	1,015	67,517	58,889	126,406	11	
Georgia	...	...	...	13	4,474	10,053	6,365	16,418	7	
Kentucky	...	...	...	7	4,077	13,653	7,332	20,985	4	
Missouri	...	...	...	3	126	3,000	1,430	4,450	3	
N. Carolina	...	...	...	7	...	7,203	1,632	8,835	3	
Oklahoma	...	...	...	17	10,589	97,860	16,972	114,832	5	
Tennessee	...	...	...	14	6,317	23,204	15,840	39,044	17	
Texas	...	...	...	11	410	86,682	99,175	185,857	17	
Virginia	...	...	...	13	...	12,217	5,263	17,480	11	
Total	...	...	...	101	29,315	328,064	220,780	548,844	82	

Times of Sunrise and Sunset at Brisbane, 1908.

DATE.	MAY.		JUNE.		JULY.		AUGUST.		PHASES OF THE MOON.	
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.		
1	6.14	5.16	6.30	5.0	6.39	5.4	6.30	5.18	1 May	● New Moon 1 33 a.m.
2	6.14	5.15	6.31	5.0	6.39	5.4	6.29	5.19	8 "	☾ First Quarter 9 23 p.m.
3	6.15	5.15	6.31	5.0	6.39	5.4	6.29	5.19	16 "	○ Full Moon 2 32 "
4	6.15	5.14	6.32	5.0	6.39	5.5	6.28	5.20	23 "	☾ Last Quarter 10 17 a.m.
5	6.16	5.13	6.32	5.0	6.39	5.5	6.28	5.20	30 "	● New Moon 1 14 p.m.
6	6.16	5.12	6.33	5.0	6.39	5.5	6.27	5.21		
7	6.17	5.12	6.33	4.59	6.39	5.6	6.26	5.21	7 June	☾ First Quarter 2 56 p.m.
8	6.17	5.11	6.33	4.59	6.39	5.6	6.25	5.22	14 "	○ Full Moon 11 55 "
9	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.22	21 "	☾ Last Quarter 3 26 "
10	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.23	29 "	● New Moon 2 31 a.m.
11	6.19	5.9	6.35	4.59	6.39	5.7	6.23	5.23		
12	6.19	5.8	6.35	4.59	6.38	5.8	6.22	5.24	7 July	☾ First Quarter 6 25 a.m.
13	6.20	5.8	6.36	4.59	6.38	5.8	6.21	5.24	14 "	○ Full Moon 7 48 "
14	6.21	5.7	6.36	4.59	6.38	5.9	6.21	5.25	20 "	☾ Last Quarter 10 2 p.m.
15	6.21	5.7	6.36	4.59	6.38	5.9	6.20	5.25	28 "	● New Moon 5 17 "
16	6.22	5.6	6.37	5.0	6.37	5.10	6.19	5.26		
17	6.22	5.6	6.37	5.0	6.37	5.10	6.18	5.26	5 Aug.	☾ First Quarter 7 40 p.m.
18	6.23	5.5	6.37	5.0	6.37	5.11	6.17	5.27	12 "	○ Full Moon 2 59 "
19	6.23	5.5	6.37	5.0	6.37	5.11	6.16	5.27	19 "	☾ Last Quarter 7 25 a.m.
20	6.24	5.4	6.38	5.0	6.36	5.12	6.15	5.28	27 "	● New Moon 8 59 "
21	6.25	5.4	6.38	5.1	6.36	5.12	6.14	5.28		
22	6.25	5.3	6.38	5.1	6.35	5.13	6.13	5.29		
23	6.26	5.3	6.38	5.1	6.35	5.13	6.12	5.29		
24	6.26	5.2	6.39	5.1	6.34	5.14	6.11	5.30		
25	6.27	5.2	6.39	5.1	6.34	5.14	6.10	5.30		
26	6.28	5.1	6.39	5.2	6.34	5.15	6.9	5.31		
27	6.28	5.1	6.39	5.2	6.33	5.15	6.8	5.31		
28	6.29	5.1	6.39	5.3	6.32	5.16	6.7	5.31		
29	6.29	5.1	6.39	5.3	6.32	5.17	6.6	5.32		
30	6.30	5.0	6.40	5.3	6.31	5.17	6.5	5.32		
31	6.30	5.0	...	...	6.31	5.18	6.4	5.33		

General Notes.

THE COTTON MARKET.

The following were the prices for cotton in London on 9th April, according to Messrs. Slann and Davies:—

	Good, Fair.	Good.	Fine.	Superfine.	COMPARH.	
					Good, 1907.	Good, 1906.
	d. d.	d. d.	d. d.	d.	d. d.	d. d.
Surat kinds*	$4\frac{5}{16}$ to $4\frac{19}{32}$	$4\frac{1}{2}$ to $4\frac{15}{16}$	$4\frac{13}{16}$ to $5\frac{1}{4}$	...	$4\frac{3}{8}$ to $5\frac{3}{16}$	$4\frac{13}{16}$ to $5\frac{7}{16}$
Madras	$4\frac{1}{2}$ to $4\frac{3}{4}$	$3\frac{15}{16}$ to 5	...	...	$4\frac{7}{8}$ to $5\frac{5}{16}$	$4\frac{7}{8}$ to $5\frac{9}{16}$
Bengal	$3\frac{15}{16}$	$3\frac{9}{16}$	$3\frac{13}{16}$	$3\frac{3}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$
Assam, &c.	...	$4\frac{1}{2}$	$5\frac{1}{4}$	6	$5\frac{1}{4}$	...
China	...	$4\frac{1}{2}$	$5\frac{1}{4}$	$5\frac{3}{4}$	$5\frac{1}{8}$	$5\frac{1}{16}$
West Indian	6	$6\frac{3}{4}$	$7\frac{1}{4}$	$7\frac{3}{4}$	$6\frac{7}{8}$	$6\frac{1}{2}$
Sea Island	$7\frac{1}{2}$	10	$15\frac{1}{2}$	$17\frac{1}{2}$	$11\frac{1}{2}$	$9\frac{1}{2}$
Australia	$6\frac{1}{2}$	$6\frac{3}{4}$	...	...	$6\frac{3}{4}$	$6\frac{1}{2}$

* Liverpool quotations.

A more cheerful feeling pervaded the market in the early part of the week ending 9th April, but a Continental failure, followed by heavy liquidations, caused a complete change in the position, and for several days prices have moved materially in favour of buyers. Spot middling is 12 points down to 5·67d., and "Futures" are $10\frac{1}{2}$ to $12\frac{1}{2}$ points lower for near, and 14 to 15 for distant. East Indian has met with a little more inquiry, but prices are about $\frac{1}{16}$ d. lower.

The import into Liverpool this week amounts to 31,524 bales, this year 1,602,894, same week last year 84,514, last year's total 2,146,297 bales. The estimated sales amount to 51,000 bales. Middling American is quoted at 5·67d. per lb.; last year, 6·12d.; 1906, 6·24d.; 1905, 4·24d.

The latest quotations of Americans for delivery, basis middling, any port, G.O.C., were:—

	9th April.	Last week.	Last year.
April	5·21d.	5·31 $\frac{1}{2}$ d.	5·75d.
April-May	5·19d.	5·29 $\frac{1}{2}$ d.	5·73d.
May-June	5·19d.	5·30 $\frac{1}{2}$ d.	5·73d.

Movement of American Cotton since 1st September.

	1907-8.	1906-7.	1905-6.	1904-5.
Brought into sight ...	9,994,000	12,118,000	9,481,000	10,800,000
Exports from United States since 1st September—				
To Great Britain ...	2,576,000	3,275,000	2,463,000	2,980,000
To Continent, &c....	3,564,000	3,731,000	2,635,000	3,284,000
Total crop	...	13,510,982	11,347,000	13,565,800

Cotton Seed.—Up at Liverpool 400 bags Peruvian sold at £5 15s. per ton on the quay. In London a large business is reported in Bombay, at a considerable advance, and Egyptian is also dearer. Sales include Egyptian spot in

London, £7 12s. 6d.; Hull, £7 10s.; Bombay, afloat, £6 6s. At the close, however, an easing down was noticeable, Egyptian spot, both in London and Hull, being quoted at £7 11s. 3d.

British cotton-seed cake is quoted at £5 to £5 5s. ton, against £4 15s. to £4 17s. 6d. at this time last year.

Cotton-seed oil recently advanced 10s., but closed quieter, at £23 for crude, London, and £22 12s. 6d. for naked at Hull. Up at Liverpool the market for refined continues steady at £1 5s. 3d. to £1 5s. 9d. for edible, according to quality, and £1 4s. 9d. for ordinary.

MENDING BROKEN CAST IRON.

In the days when copper washing-boilers were almost unknown in Queensland, the cast-iron boiler was universally used by housewives on washing day. These were very liable to get cracked, and as there were no means of mending them, hundreds were thrown away as useless. At last, however, according to the Adelaide "Farm," the problem has been solved.

It has been the aim for many years of practical engineers to discover a cheap and expeditious method by which broken cast-iron parts of machinery could be satisfactorily mended. The discovery has at last been made, and, as frequently happens, it had its origin in the United States of America—the home of practical invention. "Weldarine" is the name of the principal flux used, in addition to specially-prepared borax and spelter.

The method of applying "Weldarine" is simplicity itself. All that is necessary is that the fracture should first be carefully cleaned by the use of a wire brush; then both parts must be covered with a paste made of "Weldarine" powder and fluid. After clamping or wiring the parts together, a coating of this paste is put $\frac{1}{2}$ -inch wide all around the joint; this coating is then dried, either by air or artificial heat, the part is brought to a cherry-red heat in the fire, "Weldarine" borax is applied, followed immediately by "Weldarine" spelter; the job allowed to cool down, and it is then complete.

Who could wish for anything more simple?

The highest value of the new medium is not the cost of the broken part—although that, too, is a great consideration—but is more the immense saving of lost time to the owner of broken-down machinery, which may occasion great inconvenience, and a loss in output which cannot be calculated. The application of the new substance, the efficacy of which has recently been so well demonstrated, has already saved one factory in Adelaide a very great deal of trouble and incalculable expense. This factory, the work of which is almost wholly carried out by machinery working in series, had a serious break-down in a casting on one of its machines. No spare parts of this machine were obtainable in Australia, so this meant that until the broken part was repaired or replaced the whole of the work of the factory which would pass through this machine must be kept back. In this desperate plight the factory manager telephoned for a mechanic, whom he knew had tried the "Weldarine" compounds, with the result that within an hour the machine was repaired and the usual flow of work resumed. At a practical and highly successful demonstration given at the Adelaide March Show, a farmer stated that he had, by the use of "Weldarine" replaced one of two cogs stripped from the bull-wheel of a traction engine, and that, not being able to find the other cog, he had improvised one from an old piece of cast iron and "Weldarined" it on most successfully on a flat bed, without dowels or dovetailing.

At the Mount Barker show held last month a representative of "Art, Trade, and Industry" witnessed a number of most drastic tests of the application of the process, and was convinced that the veriest tyro could successfully

mend cast iron by using the "Weldarine" substances, with the aid only of an ordinary portable forge, a file, and a small vice. The most severe test was applied to two parts of a bar of cast iron measuring 1 inch in width by $\frac{1\frac{1}{8}}$ -inch in depth. These were first brazed together in the form of a T, the tail-piece resting upon the top of the cross-bar, and, after many attempts, the bar forming the tail-piece was broken off at right angles to the joint, carrying away with it a small portion of the cross-bar. This fracture was in turn treated in the ordinary method and duly mended, without interfering in any way with the first joint. After repeated attempts to break away this joint, the bar broke an inch below the mend. This new break was also made good, and the engineers and blacksmiths present merrily plied a heavy smith's hammer in the hope of breaking one of the three joints. The only result of their efforts was to break away one of the top pieces of the cross-bar of the T-piece, at right angles to the first joint, and also at right angles to the first fracture. The remarkable points about this test is that two of the joints were made by a novice in the art of brazing—thus proving that the work of using the materials can be carried out by anyone who will follow out instructions—and that the first three brazings successfully withstood the subsequent severe firings in the forge without the slightest damage.

The uses of "Weldarine" are not limited to cast-iron alone, as it has been amply demonstrated that it will braze cast iron to wrought iron or steel, or will braze either of these two metals themselves together. It should prove a cheap and expeditious method of joining together the ends of builder's bond iron, making a quick, safe, and neat joint, obviating the cumbersome and unsafe hooked ends which are commonly used. Many large contractors, coach-builders, and ironworkers in the United States have adopted the use of "Weldarine" for joining up wrought as well as cast iron, in order to ensure a neat as well as a durable junction. Why should we not in Australia follow so good an example?

Answers to Correspondents.

NITRE, BENZINE, ETC.

H. H., South Kolan—

1. Nitre is potassium nitrate, or saltpetre; spirits of nitre, or sweet nitre, is the pharmaceutical preparation: *Spiritus ætheris nitrici*, or *Spiritus ætheris nitrosi*.

2. Benzene, or benzol, is the hydrocarbon $C_6 H_6$; benzin, benzolene, gasolene, petroleum spirit, or naphtha, are mixtures of volatile hydrocarbons prepared on purification of crude petroleum containing chiefly Herxane $C_6 H_{14}$.

3. The last edition of Newth's "Inorganic Chemistry" was published in 1906.

4. Weight of green stuff per acre: The variations are so great that it is only possible to give a rough estimate. Wheat and barley should yield about 8 tons of green stuff to the acre; panicum, 9 to 10 tons; lucerne, 4 to 5 tons.

WHAT CONSTITUTES AN ACRE OF TOBACCO?

A. FONTAINE, Kelsey Creek, Bowen—

Mr. R. S. Neville, to whom your question was submitted, says:—"In tobacco, there is no commercial usage or necessity for creating imaginary areas; hence, an acre of tobacco is 10 square chains (1 by 10) of land planted in tobacco." In your letter you give 120 chains as an acre of sugar-cane. Does this not mean 12'0 chains?

The Markets.

PRICES FOR FRUIT—ROMA-STREET MARKETS.

Article.	MAY.	
	Prices.	
Apples, per case	7s. to 10s.	
Apples, New England, per packer	...	
Apricots, Local, per packer	...	
Bananas, Fiji, per case	...	
Bananas, Fiji, per bunch	...	
Citrons, per case	10s. 6d. to 11s.	
Cumquats, quarter-case	1s. 6d. to 2s. 3d.	
Cocoanuts, per dozen	...	
Custard Apples, per case	3s. to 5s. 6d.	
Lemons (Lisbon), per case	2s. 6d. to 5s.	
Lemons, rough, per case	2s. to 2s. 6d.	
Mandarins, per case	2s. to 5s. 6d.	
Oranges, per case	1s. 6d. to 3s. 6d.	
Passion Fruit (Local), per case	...	
Papaw Apples, per quarter-case	...	
Peaches, per quarter-case	...	
Pears, per case	...	
Persimmons, per case	...	
Pineapples, smooth, per dozen	2s. to 5s.	
Pineapples, rough, per dozen	1s. 3d. to 4s.	
Rosellas, per sugar bag	2s. to 2s. 9d.	
Strawberries, per tray	2s. 6d. to 3s.	
Strawberries, per dozen boxes	6s. to 8s. 10d.	
Tomatoes, per case	2s. 6d. to 4s. 3d.	

SOUTHERN FRUIT MARKET.

Bananas, Fiji, per case	14s. 6d. to 15s.
Bananas, Fiji, per bunch	2s. to 9s.
Bananas, Queensland, per case	12s. 6d. to 13s.
Bananas, Queensland, per bunch	1s. 6d. to 6s.
Cocoanuts, per doz.	2s. to 2s. 6d.
Lemons, coloured, per case	6s. to 6s. 6d.
Lemons, small, per case	3s.
Lemons, South Australian	6s. to 7s.
Loquats, per case	4s.
Mandarins, Emperor, per case	7s. 6d.
Mardarins, B.G.R., per case	3s. 6d. to 4s. 6d.
Mandarins, local	7s. 6d.
Oranges, Queensland, per case	5s. to 6s.
Oranges, Queensland, choice, per case	7s. to 8s.
Oranges, medium, per case	...
Passion Fruit, per case	7s.
Peaches, Victorian, per box of 7½ dozen	...
Peanuts, per lb.	2½d.
Pears, per bushel case	...
Pineapples, Queensland (Ripley's), per dozen	5s. to 5s. 6d.
Pineapples, Queensland (smooth), per dozen	5s. 6d.
Pineapples, Queensland, common, per dozen	4s. 6d.
Persimmons, per case	...
Pomegranates, per case	...
Rockmelons, per gin case	...
Strawberries, Queensland, per three-quart tray	3s. 6d. to 4s. 6d.
Tomatoes, per box	4s. 6d.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR
JUNE.

Article.							JUNE.
							Prices.
Bacon, Pineapple ...	...	...	...	...	...	lb.	6½d. to 8d.
Bran ...	...	...	...	...	...	ton	£7 10s.
Butter, Factory ...	...	...	...	...	...	lb.	1s. 1½d.
Chaff, Mixed ...	...	...	...	...	...	ton	£3 to £5 10s.
Chaff, Oaten ...	...	...	...	...	...	,,	£6 5s. to £8 10s.
Chaff, Lucerne ...	...	...	...	...	...	,,	£4 15s. to £6 10s.
Chaff, Wheaten ...	...	...	...	...	...	,,	£3 15s. to £4 5s.
Cheese ...	...	...	...	...	...	lb.	8½d. to 9d.
Flour ...	...	...	...	...	...	ton	£10 15s. to £11
Hay, Oaten ...	...	...	...	...	...	,,	£8 to £8 10s.
Hay, Lucerne ...	...	...	...	...	...	,,	£4 5s. to £5 10s.
Honey ...	...	...	...	...	...	lb.	3d. to 3½d.
Maize ...	...	...	...	...	...	bush.	4s. 2½d. to 4s. 4d.
Oats ...	...	...	...	...	...	,,	3s. 9d. to 4s. 3d.
Pollard ...	...	...	...	...	...	ton	£7 10s.
Potatoes ...	...	...	...	...	...	,,	£4 to £6
Potatoes, Sweet ...	...	...	...	...	...	,,	...
Pumpkins ...	...	...	...	...	...	,,	...
Wheat, Milling ...	...	...	...	...	...	bush.	5s. 3d.
Wheat, Chick ...	...	...	...	...	...	,,	4s. 9d. to 5s.
Onions ...	...	...	...	...	...	ton	£8 5s. to £8 15s.
Hams ...	...	...	...	...	...	lb.	11d. to 1s.
Eggs ...	...	...	...	...	...	doz.	1s. 4d. to 1s. 10d.
Fowls ...	...	...	...	...	...	pair	2s. 6d. to 4s.
Geese ...	...	...	...	...	...	,,	5s. to 6s. 9d.
Ducks, English ...	...	...	...	...	...	,,	3s. to 4s. 10d.
Ducks, Muscovy ...	...	...	...	...	...	,,	4s. 3d. to 4s. 9d.
Turkeys (Hens) ...	...	...	...	...	...	,,	6s. 9d.
Turkeys (Gobblers) ...	...	...	...	...	...	,,	11s. to 13s.

ENOGGERA SALEYARDS.

Animal.							MAY.
							Prices.
Bullocks ...	...	...	...	...	...	...	£7 10s. to £9 2s. 6d.
Cows ...	...	...	...	...	...	...	£6 2s. 6d. to £8
Merino Wethers ...	...	...	...	...	...	...	17s. 6d.
C.B. " ...	...	...	...	...	...	...	19s. 3d.
Merino Ewes ...	...	...	...	...	...	...	15s.
C.B. " ...	...	...	...	...	...	...	21s. 6d.
Lambs ...	...	...	...	...	...	...	13s. 6d.
Pigs (Baconers) ...	...	...	...	...	...	...	...
,, (Porkers) ...	...	...	...	...	...	...	...

Orchard Notes for August.

By ALBERT H. BENSON, M.R.A.C.

THE SOUTHERN COAST DISTRICTS.

The remarks that have appeared in these notes during the last few months respecting the handling and marketing of citrus fruits apply equally to the present month. — The bulk of the fruit, with the exception of the latest ripening varieties in the latest districts, is now fully ripe, and should be marketed as soon as possible, so that the orchards can be got into thorough order for the spring growth. All heavy pruning should be completed previous to the rise in the sap; and where winter spraying is required, and has not yet been carried out, no time should be lost in giving the trunks, main branches, and inside of the trees generally a thorough dressing with the lime and sulphur wash.

Where there are inferior sorts of seedling citrus trees growing, it is advisable to head same hard back, leaving only the main trunk and four or five well-balanced main branches cut off at about 2 feet from the trunk. When cut back give a good dressing with the lime and sulphur wash. Trees so treated may either be grafted with good varieties towards the end of the month, or early in September; or, if wished, they may be allowed to throw out a number of shoots, which should be thinned out to form a well-balanced head, and when large enough should be budded with the desired variety.

Grafting of young stock in nursery, not only citrus but most kinds of deciduous fruits, can be done this month. It comes in useful in the case of stocks that have missed in budding, but for good clean-grown stocks I prefer budding.

In the case of working our Seville orange stocks to sweet oranges, grafting is, however, preferable to budding, as the latter method of propagation is frequently a failure. The Seville stock should be cut off at or a little below the surface of the ground. If of small size, a single-tongue graft will be sufficient, but if of large size, then the best method is the side graft—two or more grafts being placed in each stock, so as to be certain of one taking. In either case the grafts are tied firmly in place, and the soil should be brought round the graft as high as the top bud. If this is done, there will be few misses, and undesirable Seville stocks can be converted into sweet oranges.

In selecting wood for grafting, take that of the last season's growth that has good full buds, and that is well-matured—avoid extra strong, or very poor growth.

Seville oranges make good stocks for lemons. In case it is desirable to work them on to lemons, it is not necessary to graft below ground, as in the case of the sweet orange, but the stock can be treated in the same manner as that recommended in the case of inferior oranges—viz., to head hard back, and bud on the young shoots.

Where orchards have not already been so treated, they should now be ploughed so as to break up the crust that has been formed on the surface during the gathering of the crop, and to bury all weeds and trash. When ploughed, do not let the soil remain in a rough, lumpy condition, but get it into a fine tilth, so that it is in a good condition to retain moisture for the trees' use during spring. This is a very important matter, as spring is our most trying time, and the failure to conserve moisture then means a failure in the fruit crop, to a greater or lesser extent.

When necessary, quickly-acting manures can be applied now. In the case of orchards, they should be distributed broadcast over the land, and be

harrowed or cultivated in; but, in the case of pines, they should be placed on each side of the row, and be worked well into the soil.

The marketing of pines, especially smooths, will occupy growers' attention, and where it is proposed to extend the plantation the ground should be got ready, so as to have it in the best possible condition for planting, as I am satisfied that the thorough preparation of the land prior to planting pines is money very well spent.

The pruning of all grape vines should be completed, and new plantings can be made towards the end of the month. Obtain well-matured, healthy cuttings, and plant them in well and deeply worked land, leaving the top bud level with the surface of the ground. Instead of leaving 6 or 7 inches of the cutting out of the ground to dry out, as is often done. You only want one strong shoot from your cutting, and from this one shoot you can make any shaped vine you want. Just as the buds of the vines begin to swell, but before they burst, all varieties that are subject to black spot should be dressed with the sulphuric acid solution—viz., three-quarters of a pint of commercial sulphuric acid to one gallon of water; or, if preferred, this mixture can be used instead—viz., dissolve 5 lb. of sulphate of iron (from copperas) in one gallon of water, and when dissolved add to it half a pint of sulphuric acid.

TROPICAL COAST DISTRICTS.

Bananas should be increasing in quality and quantity during the month, and though, as a rule, the fruit fly is not very bad at this time of the year, still it is advisable to take every care to keep it in check. No over-ripe fruit should be allowed to be about in the gardens, and every care should be taken to keep the pest in check when there are only a few to deal with, as, if this is done, it will reduce the numbers of the pest materially later on in the season. The spring crop of oranges and mandarins will be now ready for marketing in the Cardwell, Tully, Cairns, and Port Douglas districts. For shipping South see that the fruit is thoroughly sweated, as unless the moisture is got rid of out of the skins the fruit will not carry. Should the skins be very full of moisture, then it will be advisable to lay the fruit on boards or slabs in the sun to dry; or, if this is not possible, then the skin of the fruit should be artificially dried by placing same in a hot chamber, as the moisture that is in the skin of our Northern-grown citrus fruits must be got rid of before they will carry properly.

Papaws and granadillas should be shipped South, and the markets tested. If carefully packed in cases holding only one layer of fruit, and sent by cold storage, these fruits should reach their destination in good order. Cucumber and tomato shipments will now be in full swing from Bowen. Take care to send nothing but the best fruit, and do not pack the tomatoes in too big cases, as tomatoes always sell on their appearance and quality.

SOUTHERN AND CENTRAL TABLELANDS.

All fruit-tree pruning should be finished during the month, and all trees should receive their winter spraying of the lime and sulphur wash.

All new planting should be completed, orchards should be ploughed and worked down fine, and everything got ready for spring.

In the warmer parts grape-pruning should be completed, and the vines should receive the winter dressing for black spot. In the Stanthorpe district grape-pruning should be delayed as late as possible, so as to keep the vines back, as it is not early but late grapes that are wanted, and the later you can keep your vines back the better chance they have of escaping spring frosts.

Towards the end of the month inferior varieties of apples, pears, plums, &c., should be worked over with more desirable kinds; side, tongue, or cleft grafting being used. In the case of peaches, almonds, or nectarines, I prefer to head back and work over by budding on the young growth.

Farm and Garden Notes for August.

This and the following two months are about the busiest periods of the year so far as work in the field is concerned; and the more activity now displayed in getting in the summer crops the richer will be the reward at harvest time. Potatoes should be planted, taking care to select only good sound seed that has sprouted. This will ensure an even crop. Yams, arrowroot, ginger, sisal hemp, cotton, and sugar-cane may now be planted. Sow maize for an early crop. If the seed of prolific varieties is regularly saved, in the end it will not be surprising to find from four to six cobs on each stalk. This has been the experience in America, where the selecting of seeds has been reduced to a fine art.

In choosing maize for seed, select the large, well-filled, flat grains. It has been shown that, by constantly selecting seed from prolific plants, as many as five and six cobs of maize can be produced on each stalk all over a field. A change of seed from another district is also beneficial. Sow pumpkins, either amongst the maize or separately, if you have the ground to spare. Swede turnips, clover, and lucerne may be sown, but they will have to contend with weeds which will begin to vigorously assert themselves as the weather gets warmer; therefore keep the hoe and cultivator constantly going in fine weather. Tobacco may be sown during this month. If vines are available, sweet potatoes may be planted towards the end of the month. In this case also it is advisable to avoid too frequent planting of cuttings from the old vines, and to obtain cuttings from other districts. If grasses have not yet been sown, there is still time to do so, if the work be taken in hand at once. Sugar-cane crushing will now be in full swing, and all frosted cane in the Southern district should be put through the rollers first. Plough out old canes, and get the land in order for replanting. Worn-out sugar lands in the Central and Northern districts, if not intended to be manured and replanted, will bear excellent crops of sisal hemp. Rice and coffee should already have been harvested in the North. The picking of Liberian coffee, however, only begins this month. Collect divi-divi pods. Orange-trees will be in blossom, and coffee-trees in bloom for the second time. As this is generally a dry month in the North, little can be done in the way of planting.

Kitchen Garden.—Nearly all spring and summer crops can now be planted. Here is a list of seeds and roots to be sown which will keep the market gardeners busy for some time: Carrots, parsnip, turnip, beet, lettuce, endive, salsify, radish, rhubarb, asparagus, Jerusalem artichoke, French beans, runner beans of all kinds, peas, parsley, tomato, egg-plant, sea-kale, cucumber, melon, pumpkin, globe artichokes. Set out any cabbage plants and kohlrabi that are ready. Towards the end of the month plant out tomatoes, melons, cucumbers, &c., which have been raised under cover. Support peas by sticks or wire-netting. Pinch off the tops of broad beans as they come into flower to make the beans set. Plough or dig up old cauliflower and cabbage beds, and let them lie in the rough for a month before replanting, so that the soil may get the benefit of the sun and air. Top-dressing, where vegetables have been planted out, with fine stable manure has a most beneficial effect on their growth, as it furnishes a mulch as well as supplies of plant food.

Flower Garden.—All the roses should have been pruned some time ago, but do not forget to look over them occasionally, and encourage them in the way they should go by rubbing off any shoots which tend to grow towards the centre. Where there is a fine young shoot growing in the right direction, cut off the old parent branch which it will replace. If this work is done gradually

it will save a great deal of hacking and sawing when next pruning season arrives. Trim and repair the lawns. Plant out antirrhinums (snapdragon), pansies, hollyhocks, verbenas, petunias, &c. Sow zinnias, amaranthus, balsam, chrysanthemum, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins; and plant gladiolus, tuberose, amaryllis, pancratium, ismene, crinum, belladonna, lily, and other bulbs. In the case of dahlias, however, it will be better to place them in some warm moist spot, where they will start gently and be ready to plant out in a month or two. It must be remembered that this is the driest of our months. During thirty-eight years the average number of rainy days in August was seven, and the mean average rainfall 2'63 inches, and for September 2'07 inches, increasing gradually to a rainfall of 7'69 inches in February.

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NOTICE.

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It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

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Agriculture.

PRICKLY PEAR AS FODDER.

Some time ago, Mr. R. T. Keys, Muswellbrook, wrote on the above subject to the "Stock and Station Journal," and we draw attention to his remarks, as some people have a firm belief in the value of the pear, not only as a life-sustainer in dry seasons, but even as a fattening fodder. Mr. Keys' remarks are as follow :—

By advocating the use of the noxious weed at this adverse period of our history, when stock-owners are eager to discover drought-resisting plants, much injury may be done to the pastoral industry by causing some graziers to relax their efforts in the eradication of prickly pear, on account of men of standing hastily giving it a fictitious value, and mayhap thus cause valuable properties to be overrun with the pest in a year or two, and rendered worthless. In a conversation I had with Mr. Maiden, the well-known botanist, and Curator of the Sydney Botanical Gardens, a year or two ago, we discussed the question of the utility of prickly pear for fodder, and he assured me that analyses by himself and other scientists had proved beyond doubt that the earth does not produce a plant with less nutriment for stock than the prickly pear, and he accordingly urged every true friend of the pastoral industry, and consequently patriotic son of the State, to never lose an opportunity in helping on the work of its eradication. "If," added Mr. Maiden, "you were to put a handful of pollard into a 400-gallon tank filled with prickly pears, that small quantity of pollard would have more life-sustaining nutriment for stock than the whole of the pears with which it had been mixed."

Mr. F. S. Bell, of Pickering, who has had a life-long experience as a grazier, recently put the prickly pear to a thorough test, and no greater object lesson was ever given in New South Wales of its utter worthlessness as fodder than that which resulted from the comprehensive experiments of my esteemed neighbour. Like all stock-owners, Mr. Bell was severely affected by the drought, and could have turned his cattle into a large paddock covered with prickly pear; but, having had forty years' experience of the plant, he felt certain that trying to graze stock upon it would be useless; but he resolved to thoroughly test it otherwise, and prove if it were able to sustain his stock, and capable of helping them through the severely dry time we were experiencing. He therefore had considerable quantities of the prickly pear plants cut, and went to great expense in erecting pots in different parts of his paddocks for the thorough boiling of the pears. In this way he fed 400 bullocks for nearly three months, but they did no good on the prepared pear fodder, became poorer from week to week, until at last Mr. Bell had to send them away to the coast to save their lives.

No better trial of the value of the pear than the foregoing was ever given in Australia, and no more experienced or practical man to deal with the subject under notice can be found in the Commonwealth than the gentleman who made the test. Yet, in the face of this lifelong experience and complete test, Mr. Peele will contend that cattle were fattened at Womblebank on the worthless and noxious plants. I might also be permitted to point out to Mr. Peele, and anyone who may think with him, that the Hunter River stock-owners have had more experience of prickly pear than the graziers of any other part of Australia, inasmuch as the noxious weed was first brought to Scone in the thirties, and they are unanimous in condemnation of the pest; a number of the most experienced of them having recently had miles of prickly pear to put their stock on, had they so desired, but they sent their cattle to the coast, knowing that it would be madness to try and keep them alive on the noxious plant.

With regard to the Womblebank bullock theory, an old Womblebank stockman who has been recently visiting Muswellbrook has given me what seems to be a correct version of the pear-fattening story, and a very reasonable explanation of how the fattening of the stock in question was effected. It appears that at Womblebank there is an extensive growth of pears that covers an area of 15 miles, but the vegetable products on that portion of land do not consist solely of prickly pears, for an exploration of the locality disclosed the fact that it contained patches of good grass 10, 15, and 20 acres in extent, which had been preserved by the surrounding growth of pears, that, barrier-like, had kept cattle out until the great scarcity of food caused the bullocks to break through and reach the grass, which, although old and dry, was still nutritious, and enabled the bullocks to preserve their condition when stock in other parts of the run wasted away, the pears, as explained, therefore getting undeserved credit for the fattening result.

I am well aware that Mr. Peele is as much interested as anyone else in the welfare of the State, and strongly desirous of promoting the pastoral industry; but his ill-advised, though strong, advocacy of the use of the prickly pear, by influencing others, might some day cause an intelligent Government to take steps to protect the noxious weed to the general detriment of the landholders of the country. It is, therefore, to be hoped that he will discontinue his advocacy of the use of the pear till possessed of full information in its regard, and which I am sure will convince him of its worthlessness.

I will concede that stock will eat prickly pear when all edible grass and scrub have failed, and while feeding on it will require little or no water; but they will never thrive on it, as has been conclusively proved by the illustrations given.

Anyone who will take the trouble to open beasts that have been fed on prickly pear will see the mouths and entrails penetrated with thorns, and then realise the cruelty, as well as the futility, of giving the animals such food.

PREPARATION OF PRICKLY PEAR FOR STOCK.

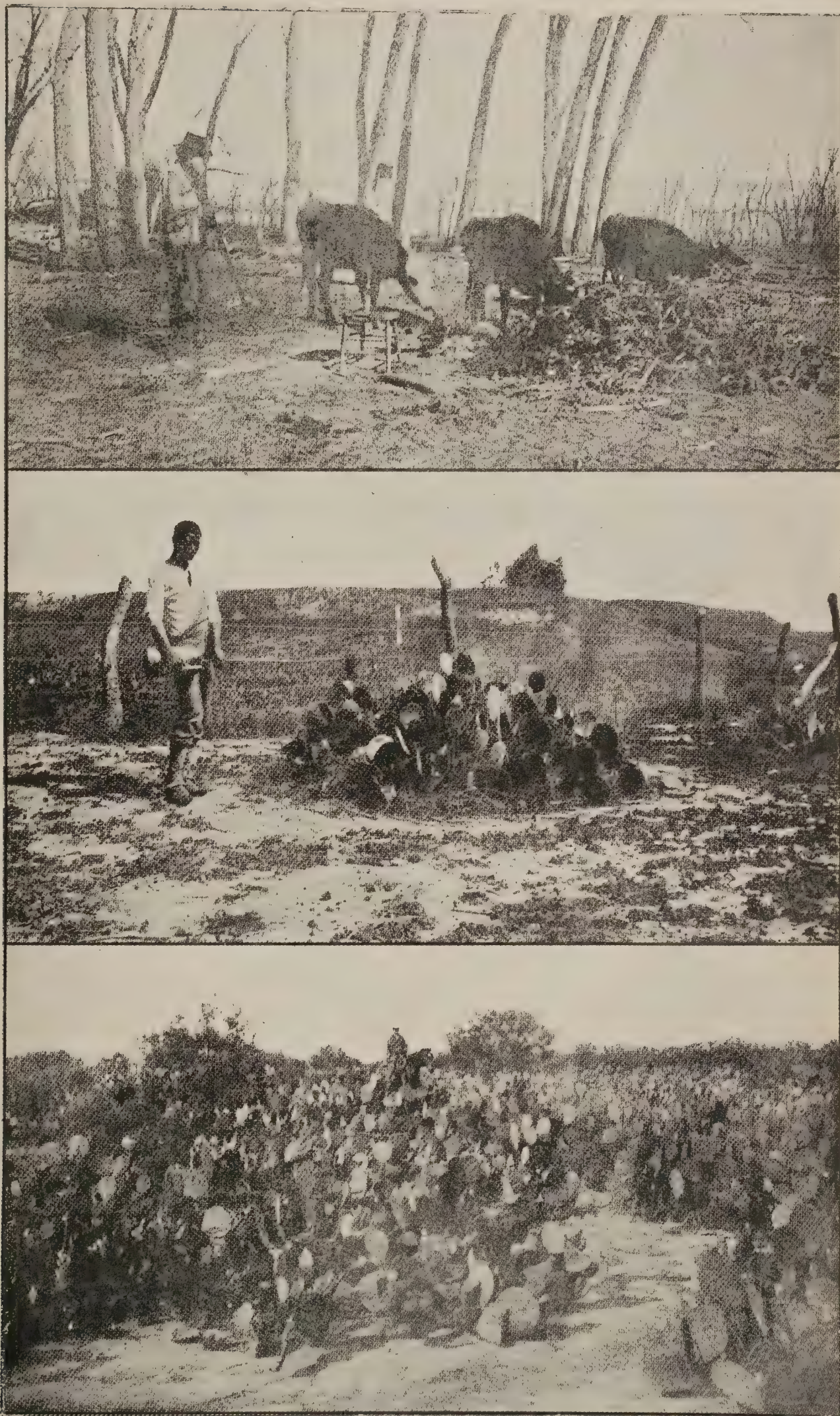
Referring to an article in the last issue of the Journal on the above subject, we now give a few illustrations taken from Bulletin No. 74 of the United States Department of Agriculture, showing the method of dealing with the pear in Texas. By the use of the pear-cutting machine here shown, the cactus may be chopped into such small pieces that the spines are rendered innocuous by the abrasion. The machine consists mainly of a solid cast-iron wheel, 4 feet in diameter, with two knives arranged at a narrow angle with the radius on one of its faces. Behind each knife, hollowed out of the face of the casting, there is a pocket extending the length of the radius. The front face of the wheel is plain, save for these pockets, which receive the chopped pear, and carry it out of the machine. The pockets are $1\frac{1}{4}$ inch deep, 22 inches long, and 9 inches wide. When the machine is set up, a short chute is bolted at an acute angle with the face of the vertical wheel. The pear is forked into this chute, fed against the revolving knives, and is cut and mashed into small pieces. By the help of this machine, ten men can cut a full ration for 2,000 head of cattle.

The pear burners here depicted were fully described in the July issue of the Journal.

With respect to the value of pear fodder for stock, it is said to be universally recognised throughout the pear region of Texas that the plant has a decided tendency to increase the flow of milk; but it is always used as a supplementary ration, combined with hay and bran, more for the sake of its succulence than for any feeding value it may possess, green feed being an essential for milk production during the winter, and that is furnished by the prickly pear during that portion of the year when there is no green feed.



1. Prickly Pear Cutter.
2. A Pear Thicket in Texas.
3. Prickly Pear of Texas in Full Fruit.



1. The Cane Cactus of Colorado, singed with Brush.
2. The Prickly Pear of Texas, singed with a Torch.
3. Nopal de Castilla, cultivated in Southern California.

CHANGE OF SEEDS.

Certain remarks made by a writer in the "Revue Agricole" (Reunion) are intended as a warning to planters who believe that change of seed necessarily leads to the improvement of strain or of crops. The writer says that it is almost a general rule in "our countries" to change the seeds periodically. After the seeds grown on an estate have been employed for sowing purposes for two or three years consecutively, recourse is had to seeds foreign to the estate, which are obtained in the market from quarters the most renowned for seeds of good quality, which are sown in order to renew the strain. "Planting Opinion" says that we might ask if this traditional practice is justifiable, and if it would not be more profitable in the majority of cases to allow seeds to produce their own, and that to an indefinite period. He thinks that that would be much better, and that "in our district at least" they would be much benefited by it. M. d'Aygalliers argues that the only reason which militates in favour of the change or of the renewal of the seeds consists in the degeneracy of those that agriculturists collect themselves—degeneracy that grows worse year after year. But, he asks, why should this unfortunate state of degeneracy be allowed to take place? Could we not avoid it by removing its causes? This appears to him not only possible, but easy as well. He rightly says that as we have recourse to new varieties originating from soils and climates differing from those where we place them, it must be naturally expected that these foreign varieties growing under unfavourable conditions would unfortunately degenerate gradually. In order to preserve all these advantages in their cultivation, we would be then obliged to renew the seeds all the oftener, inasmuch as the deterioration would be more rapid, and to fetch them from countries where these varieties enjoy the most favourable conditions. But we cultivate only plants naturalised in our midst for a long time, and local varieties established for a number of years. These, besides, go to prove clearly that it is not the change of place, not more the result of the soil than that of the climate, that can bring about deterioration. When we wish to renew the seeds we do not go to fetch them from different centres. If our seeds degenerate or deteriorate, the only cause to which this can be attributed is to defective cultivating conditions. Now, while powerless to modify the effects of climate and soil, we are perfectly free to modify as we like the procedure and care of cultivation. It will suffice us to bring them to perfection, so that we may ourselves obtain strong and sound seeds.

It is apparent from these remarks that the writer's line of reasoning is that a planter should rely rather upon seed carefully cultivated under his own care than upon seed grown by others. A good deal might be said in support of this, but it must be remembered that the careful cultivation of seed makes a heavy call upon the time and attention of planters, and that there must be many instances in which it is better to import seeds from a well-known cultivation rather than devote special care to the raising of one's own. The writer states that it is specially important to set apart specially, for the cultivation of plant-bearing seeds, a piece of land proportionate to the quantity of seeds we wish to obtain. We can thus give to the plants producing seeds for sowing purposes the care which it is not always possible to give to plants of large growth, by way of tilling, weeding, watering, &c. The crop will take place after complete maturity; the thrashing will be carefully done; the seeds thus obtained will be cleaned and picked with care. The picking is an indispensable operation in order to obtain sowing seeds of the soundest quality. It is to the want of sufficient care under this head that the deterioration of seeds in our estates must be solely attributed. They are, in fact, satisfied with cleaning them with a winnowing machine, which still leaves seeds of good quality mixed with bad and unsound ones, and, what is worse, with those of ill-weeds. If after the cleaning of the seeds by the winnowing process they are allowed to pass through a cellular picker, not only would the bad seeds fall apart, but the good ones also would be separated according to their size into two classes—the first and second quality.

It seems needless to say that the seeds of the first quality alone—bigger and stronger than the others—should be employed for sowing purposes. Even good cultivators, however, have been several times seen to mix up the two qualities for sowing, thus rendering useless the separation made by the picker. Others again sell the seeds of the first quality, sowing only those of the second, and thus lose the best advantage that the picking gives them. For a slight immediate profit they compromise the success of their future crop. It is only in modifying this system of vitiating the seeds, and in striving to make a good selection of them by all possible means, that we could ourselves succeed in producing sound seeds for sowing. Then alone could we do away with the practice of going about the market to find suitable seeds for sowing, and for which we generally pay very dear.

DESTRUCTION OF CHARLOCK.

Wherever charlock grows plentifully in wheat fields considerable loss results to the farmer in that it smothers young plants, but its effects are less manifest in early-sown than late-sown spring corn. It sucks the substance from the land. Its large exposure of leaf surface exhales so much moisture that it deprives the roots of a corresponding quantity. This is particularly apparent on light and dry soils. Seeds sown along with corn feel the pinch of competition when the charlock has been very severe. It is known to be a host of the finger-and-toe fungus, and likewise the turnip-flea beetle and turnip weevil, as well as other insects, feed on it.

Thus it is one of the worst because one of the commonest of pestiferous weeds, whose familiar yellow flower is seen in many parts of the country, and much money has been spent, not always fruitfully, in the endeavour to exterminate it by altering rotations, extra cultivation, and other means. It is pointed out that the rough-leaved charlock should be distinguished from the smooth, the rough leaves being an important factor in the extermination of the weed by spraying. The seeds of charlock, owing to their oily nature, are long-lived, and this vitality has been a source of trouble on every farm. When ley is ploughed preparatory to oats, the seeds that have been buried come to the surface and germinate. In the ordinary course of ploughing, the stubble buries these seeds at a depth sufficient to keep them dormant, but they return to life when brought to the surface again.

The best method of dealing with the pest is by spraying, and this is successfully done in an English farming district, the requisite conditions being:—Proper mixing of the sulphate of copper, which should be finely crushed and of purity of 98 per cent., clean water, the solution being put through a canvas bag into the spraying machine; fine weather at the time of application, and the application of the spray either when the plant is from 3 to 4 inches high or in the flowering stage.

The method of preparing the solution is as follows:—Take, say, 15 lb. of sulphate of copper and a few gallons of cold water in a wooden tub; dissolve and dilute with water to 50 gallons, which is equivalent to a 3 per cent. solution. The cost of this solution per acre is 4s. 6d., and, allowing that 20 acres are sprayed in a day with a twelve-nozzle machine, the total cost per acre is 5s. 3d. for materials and labour.

To apply the solution, a machine used in Lancashire is suitable for attaching to a farm cart. It consists of a wooden barrel placed on the body of the cart and large enough to hold 50 gallons of water. A pump is screwed to the bottom of the cart, with an outlet tube connected to the base of the barrel. The apparatus for distributing the spray is lashed securely to the back of the cart, being connected by means of a rubber tube to the outlet side of the pump. Two men are required to apply the spray evenly, one to work the pump and the other to lead the horse, a strip of land about 5 yards wide being sprayed at each

round. That, of course, is a primitive form of sprayer, but it can be had especially made for the purpose, and a good plan would be for farmers to combine to purchase one.

Results of spraying in Lancashire indicate that in suitable weather, when the plant is sprayed in its young state, more than 75 per cent. of the charlock plant has been completely destroyed, and where actual death has not resulted growth has been sufficiently retarded to enable the corn to push ahead. To complete the operation and make an entire success of it, it is better to repeat the spraying about a fortnight after the first. It appears to be immaterial whether sprayed in the flower or in the young stage. Results appear to vary. Those with smaller farms can apply the spray at the rate of 3 acres a day from an ordinary knapsack sprayer.

STATE FARMS.

Although the month of July was a very inauspicious season in which to pay a visit to a State or any other farm, owing to the long-continued dry weather and frosts, there is always something to be learnt at the State farms at all times of the year. We lately paid a visit to the Hermitage State Farm, near Warwick, and that at Westbrook, near Toowoomba. To the casual visitor there was apparently nothing to attract particular attention. Both these institutions have long been famed for the success which has attended the experiments there made every year in wheat culture, more particularly in producing rust-proof varieties, whilst the Westbrook Farm is also celebrated for the splendid fruits and grapes raised in addition to field crops and new varieties of grasses. At the time of our visit nothing was to be seen in the cultivation paddocks either here or on outside farms in the shape of cereal crops. The ground had long since been prepared for the seed, but the persistent dry weather had prevented all but very small sowings. Where the fields should by this time have been green with early wheat, nothing was to be seen but large areas of ploughed land awaiting the longed-for downpour to enable sowing to be done before it is too late. Should rain fall before August, there may yet be a bountiful harvest, as on more than one occasion excellent yields were obtained from fields sown as late as the middle of August. To the reflective, unbiassed mind, the State farms are carrying out excellent work for the benefit of the agricultural as well as other portions of the community. The Department of Agriculture and Stock long ago recognised that its first duty is to take the initiative in agricultural education, and that duty has been systematically performed. To provide such education for the young people growing up is, however, only part of the work. If the education is confined to these, the process of improvement of agriculture would be very slow in producing good results. Provision had, therefore, to be made for instructing those more advanced in years. "Who wants agricultural education?" asked Sir Edward Verney, in an English newspaper. "Not the labourer," he said; "not the farmer, very seldom the land-owner. The people who want it most are those who know least about agriculture." But there are farmers and farmers. There are in all farming districts of this State skilled farmers who study their surroundings, and by their skill and experience overcome all difficulties, and skill and industry usually mean success. On the other hand, there are men settled on our lands who have had no previous agricultural training, and who, hence, often fail. If the skilled and successful farmer has need to prepare for the inevitable coming struggle for a place in the markets of the world, how much more so is it necessary for the comparatively inexperienced farmer to do so? It may here be remarked that it is mainly the skilled, experienced, and successful farmers who pay the most regular visits to the Agricultural College and State farms. They recognise that private, isolated efforts are no longer sufficient to enable them to face with success the world's

competition, and that by abstaining from taking object lessons at the Government farms they would be courting failure by continuing always on the same old lines or by making expensive experiments which frequently end in failure. There is no agriculturist living that has not something more to learn, and with us the varying degrees of skill and knowledge possessed by our existing farmers open a wide field for the specialists, instructors, and managers of the experimental farms of the Department. There are people who are short-sighted enough to believe that a State farm should be self-supporting. If those holding this belief would study what is being done by experimental farms in other countries and think the matter out, they could not but come to the conclusion that such farms amply justify the money spent on them by the work they do in saving individual farmers from heavy losses. Many of the drawbacks from which the farmers have suffered, such as losses by floods, droughts, frosts, and manifold plant diseases, have been considerably minimised by scientific discoveries in many lands, where experiments with this in view have cost the Governments many thousands of pounds; but, on the other hand, the successful results have saved many more thousands to the farmers by doing for them what it would have been impossible for them to do for themselves.

Each of our State farms has become more or less specialised for the particular products found most suitable for its district, and at each science in various ways has come to the farmers' aid, and has opened up hitherto undreamed-of possibilities in raising the yield of produce, in reducing the cost of production, and in developing new methods of treating the increased crops. Those amongst us who have seen the beginning of the sugar industry in Queensland cannot fail to acknowledge the enormous value of the science of chemistry, by which a ton of sugar, which in the early days required from 15 to 20 tons of cane to produce, can now be produced from 7 tons and even from 6 tons. In the same way the cotton seed, which Queensland farmers used to throw away, is now worth more than the lint itself. But there is no need to enumerate the multifarious ways in which scientific teaching has come to the farmer's aid, and has raised their occupation to the dignity of a profession. In our own State, the Hermitage State Farm has for years been engaged in the business of experimenting with new wheats, the Department importing them at considerable expense, and out of which, perhaps, only a few might be found of value, thus saving the farmer from possible heavy loss. Last year, for instance, a wheat evolved by hybridisation at the Hermitage yielded 40 bushels per acre at Allora. This was named Hermitage No. 2. Another wheat, No. 52, received from the South Australian Department of Agriculture, has been grown for three years with excellent results, so much so that that Department requested a quantity of it to be sent to them every year. On one plot of 28 acres there were 18 varieties grown, and 9 special varieties on another plot, and, taking the average right through, the yield was 17 bushels per acre, notwithstanding the adverse season. On this farm also there are a number of olive-trees, the produce of which was sold to some Italians at 5s. per tree, and the buyers picked them themselves. There are a number of varieties of valuable nomenclature wheats sown, but not yet above ground. Again, much attention is paid to grasses, and it is due to the experimenting with new grasses at the State farms that dairymen have now such splendid grasses, as *paspalum*, Rhodes, and canary grass. The latter appears to stand both heat, drought, and frost well, in fact, where the *paspalum* was cut down by the frost the *Phalaris* showed up beautifully green. Valuable stock has also been imported to be reared on the farm, in the shape of pigs, cattle, and Clydesdale mares (which now have foals at foot), at a cost not within the reach of all farmers, but which subsequently they can purchase at very reasonable prices. It is on this farm that may be seen the fine pure merino sheep presented to the Department by Mr. Slade, of Glengallan, which station has for so many years been famous for its breed of purebred sheep. There are 50 of these valuable animals, and they have been lately increased by the birth of 81 lambs. The ewes cut a fleece of 10 lb. and ewe-lambs 5 lb.; ram lambs, 4 lb.

Some students are taken at this farm, who receive a certain amount of pay in addition to instruction in general farm work. They are provided with excellent quarters, and will doubtless turn out good farmers when they take up land for themselves, as they will have had a very varied experience at the Hermitage.

At the Hermitage there is a very imposing-looking silo, constructed of fibro-cement. Here, again, in the matter of silos the Department has provided object lessons for farmers. It is a serious matter for a farmer, however well-to-do, to go to an expenditure of over £100 in experimenting on silo buildings; but he is relieved of this work by experiments at the Agricultural College and the State farms. This particular silo was built as an experiment, and it is stated that some farmers who had the intention of building one have come to the conclusion that the structure has three disadvantages. The first is, that the binding is not sufficiently strong to hold it together; the second, that the panels are too large and too thin ($\frac{1}{4}$ -inch thick) to resist outward pressure; and the third, that the material is easily broken by a fork or rake. If these allegations are correct, it follows that several farmers have been saved an expenditure of much money on erecting buildings which they say would not serve their purpose so well as some different form of silo. Lately, however, the two first disabilities—*i.e.*, the binding and the thinness of the material—have been successfully dealt with.

At the Hermitage there is a milking-shed for four cows 24 feet by 20 feet. The manager pointed out to us a method of working by which the same shed could be utilised for forty cows, as demonstrated to him by a visitor from New Zealand.

Turning to the State farm at Westbrook, we find that the manager is doing excellent work, far-reaching in its effects, in connection with orchard and vineyard, over and above his valuable work on experimental wheats. The trees present, of course, the usual wintry aspect assumed by deciduous trees in the winter, but all are symmetrically pruned, and during the spring and summer are laden with blossom and fruit. It is a matter of surprise to some that this farm does not produce large quantities of various varieties of fruit for supplying the market; but such a course would defeat the very object for which the orchards have been established. And here we find the same conditions as at the Hermitage—that is, the instruction of fruit-growers in the cool districts of the Darling Downs. All fruit-growers know, to their cost, the losses which have been sustained by planting imported trees, named and labelled according to catalogue, but when at last they began to bear they were frequently found to be quite other than what they purported to be. They were either inferior varieties or shy bearers, or liable to disease, or were not true to name. In such cases the purchaser lost at least five years' labour, and either had to give up fruit-growing or begin again. Here is where the great advantage of a State orchard comes in. At Westbrook there are 310 trees of various kinds grown to prove their suitability or otherwise for the Downs country. In most instances there are only three or four of each kind, so that large supplies of one description of fruit cannot be supplied, nor is it intended that they should be, the main object, as we have said, being to show what should be grown and what should be avoided. For instance, there are 200 trees on the farm which the manager has proved to be such as he could not recommend any farmer to plant.

The same with the grape vines, of which there are 210 also of different varieties. Most of these have been selected year after year, until only the best varieties of table and wine grapes are grown. All this entails large expense and a most voluminous correspondence with all parts of the Australian States and also foreign countries, as inquiries come from very many sources. This outlay is entirely saved to farmers, so that indirectly the State farms are a decided gain to the country, although they are not self-supporting.

In reference to Agricultural Colleges and State farms, the late President of the Board of Agriculture in England, speaking at the opening ceremony of

the Harper-Adams Agricultural College on the needs of agriculture, said that his own conviction was that these agricultural institutions were doing, and would continue to do, a great deal of good. He would like to see many more of them. He had often heard farmers say that the experiments at these places did not pay, and they asked, What was the use of their sons learning that to which no profit accrued? That, at first sight, seemed right; but he did not think it fair to judge State and College farms by a purely financial result. They did not profess to be worked in the way an ordinary farm was worked, but had to be managed so as to be an example to all the farms in the district. It was generally said that the farmer was the only man who had anything to learn by them, but he did not agree with that. There were others associated with the cultivation of the soil who needed educating as much as the farmer.

An American writer says that the school to which a farmer should send his boys, if he desires them to inherit his acres and keep his homestead together, is where his boy can be taught agriculture pure and undefiled in all its branches, and where the teachers have good, sound, practical agricultural common sense. Surely the students at the Queensland Agricultural College and at the State farms are receiving that sound practical agricultural education which will stand them in good stead a few years later. In the United States there are 11,000,000 acres granted to Agricultural Colleges and Experimental Farms, which institutions are attended by 6,000 students.

In conclusion, we repeat that these farms and colleges in our State were established for the purpose of the instruction of all agriculturists, young and old, in the particular culture adapted to different climates, and that object has been attained in a most gratifying manner, as is evidenced by the numerous visits paid by farmers, both singly and in large companies, to each of the State establishments, where they obtain new ideas, study new methods of cultivation, preparation and storage of crops, conservation of fodder, building of silos, &c., and carry away with them a fund of information which not only benefits themselves but their immediate neighbours. In this sense, these institutions are paying fivefold what they cost to keep up.

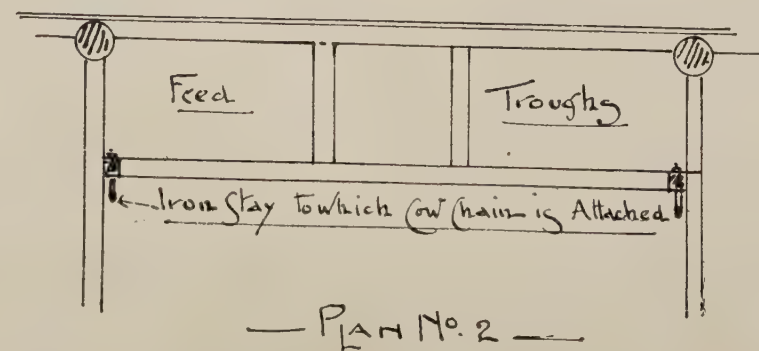
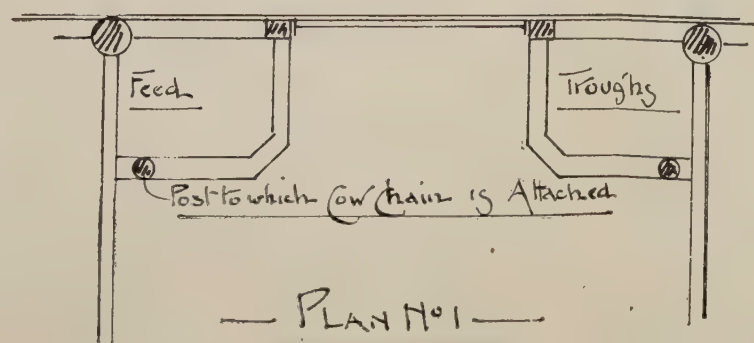
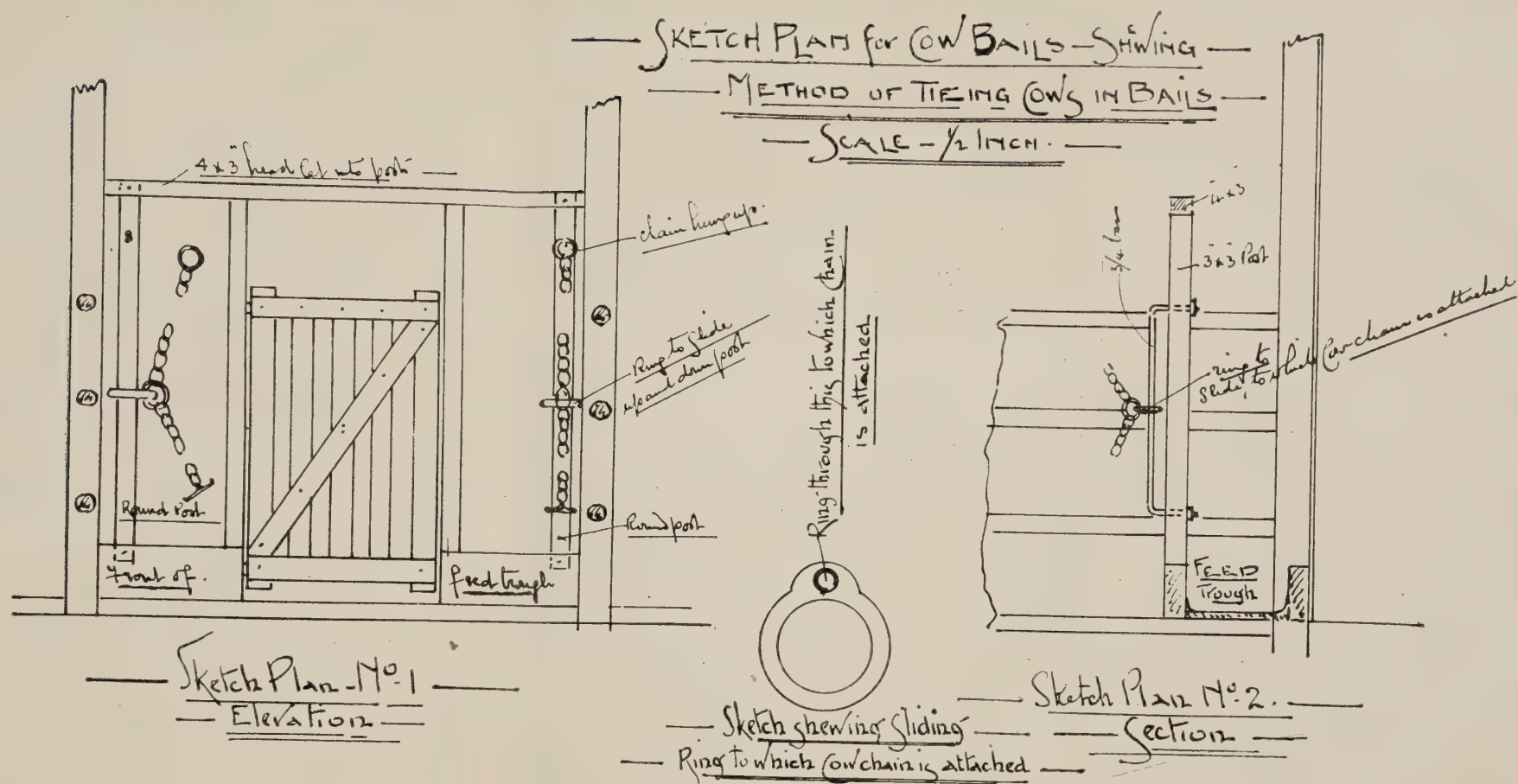
A NEW HYBRID ORANGE.

An orange which should prove a valuable acquisition to orange-growers is here illustrated. The tree, which is six years old, is a seedling, and it bears a very beautiful firm fruit of large size and bright colour. This fruit, judging from its texture, peculiar seed, and tough inner skin, as well as from the peel, which resembles in appearance and flavour that of the "Beauty of Glen Retreat," appears to be a cross between the Mandarin and the Pomelo. The combined flavour of the two species is very apparent in it. Unlike the mandarin, excepting Beauty of Glen Retreat, the peel adheres very firmly to the flesh, which latter, being itself very firm, should easily stand long-distance carriage without detriment. The tree was raised by Mr. J. A. Beal, Chief Accountant in the Lands Department, at his residence, "Matavi," Corinda, and, as stated, is now six years old and bearing well and later than other varieties. The fruit here shown measures 11 inches in circumference, with a depth of $2\frac{3}{4}$ inches. The foliage of the tree, it may be mentioned, is the same as that of the mandarin. Mr. Beal, some time ago, brought to this office the second largest sunflower ever known to be grown in Queensland. He has named the orange after his own home—"Beauty of Matavi."



"BEAUTY OF MATAVI," HYBRID ORANGE.

Plate XIII.



DEVICE FOR TYING UP COWS IN BAILS.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

RECORD OF COWS FOR MONTH OF JUNE, 1908.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Peewee ...	Holstein-Sh'rth'rn	20 May, 1908	1,072	3·8	45·62	
2	Hetty ...	Ayrshire-Sh'rth'n	26 Mar. "	788	4·7	41·48	
3	Sue ...	" "	25 May "	886	4·0	39·69	
4	Grace ...	Shorthorn ...	30 May "	1,020	3·4	38·84	
5	Rhoda ...	Grade Shorthorn	30 Mar. "	904	3·8	38·47	
6	Winnie ...	" "	15 April "	895	3·7	37·08	
7	Carrie ...	Jersey ...	4 April "	793	3·9	34·64	
8	Nettle ...	Shorthorn ...	14 May "	777	3·6	31·32	
9	Nancy ...	" "	7 May "	702	3·8	29·87	With first calf.
10	Glen ...	" "	10 Feb. "	604	4·4	29·76	
11	Cocoa ...	Jersey ...	20 Nov., 1907	577	4·6	29·73	
12	Orange ...	Grade-Guernsey	5 Oct. "	311	7·6	26·47	
13	Beauty ...	Ayrshire ...	21 Dec. "	595	3·8	25·32	
14	College Lass	" ...	1 Sept. "	476	4·7	25·05	
15	Damsel ...	Holstein ...	19 Feb., 1908	649	3·4	24·71	
16	Nellie II. ...	S. Coast Sh'rth'rn	20 Dec., 1907	445	4·2	20·95	
17	Ivy ...	Jersey ...	5 Feb., 1908	370	5·0	20·72	
18	Daisy ...	Holstein ...	" ...	535	3·4	20·35	
19	Mona ...	Grade-Holstein	26 Oct., 1907	498	3·6	20·07	
20	Lily ...	Ayrshire ...	2 May, 1908	615	3·2	20·04	
21	Lucy ...	Shorthorn ...	1 May "	433	3·9	18·91	
22	Honeycomb	" ...	23 Aug., 1907	289	5·7	18·44	
23	Lark ...	Ayrshire ...	6 June, 1908	429	3·6	17·29	With first calf.
24	Lady Ring...	Guernsey ...	" ...	245	6·2	17·01	

DEVICE FOR TYING COWS UP IN BAILS.

In the matter of bails and gates for the easiest and most effective methods of dealing with cows in the milking-shed, man hath sought out many inventions and ingenious contrivances, several of which have been described and illustrated in former issues of this Journal. Yet another has been described and sketched by Mr. A. Morry, Surveyor to the Department of Agriculture and Stock. The accompanying illustration shows a very useful method for tying up cows (not bailing up) during the night:—

An iron ring is made to slide on a post, as shown in Sketch No. 1. To this a cow-chain is attached, which enables the animal to stand or lie down at will without discomfort. In Sketch No. 2 the arrangement is slightly altered, an iron stay being bolted through the post, to which the sliding ring and cow-chain are attached. It will also be noted, by reference to the sketch plans, that the feeding troughs are placed low, so that they do not interfere with the cattle's movements in lying down or rising.

The Orchard.

THE "GOOTEE" METHOD OF PROPAGATION.

Mr. H. F. Macmillan, in the "Ceylon Tropical Agriculturist," on this subject, writes:—

"The gootee mode of propagating plants has been practised in India from early times. It is adopted in the case of trees which are difficult to raise by layering, or which seldom set seed, and also as a means of increasing any tree of special merit, or part of a tree (as a sport) exhibiting a variation which it is desirable to perpetuate. When other methods of propagation fail, the gootee is resorted to, and, if carefully carried out, it is usually successful. It is of special value in propagating fruit trees, for not only are the plants thus obtained true to kind, but they also come into bearing much earlier than plants raised from seed. The same is true of flowering trees, shrubs, climbers, &c., and for such as do not, from some cause or another produce seed, propagation by gootee is the best means of multiplying them.

"To proceed with the gootee, select a firm healthy branch, with well-ripened wood, immediately under a leaf-bud or node; take off a small ring of bark, about 1 inch wide. To this apply a ball of clayey soil, holding it securely together with coir fibre, tow, or moss, and bandaging all firmly round the branch. A little above this hang a pot or chatty; through the hole in the bottom of the latter draw from within a piece of rope; a knot tied on the end of the rope should fit tightly against the hole of the vessel above. The rope, thus secured by its knotted end within the pot, is carried on at full stretch and coiled round the gootee. By this means the water, with which the pot is kept supplied, oozes slowly out, trickles down the rope and along the coil, and so distributes itself over the whole gootee. In from three to four months young roots should be seen protruding through the gootee, when the branch may be cut from the parent tree, and planted where it is intended for it to remain. The operation should be carried out in the wet weather, commencing when active growth in the tree begins."

[A similar method of propagation has long been carried out in Queensland, but the operation is well worth drawing attention to.—Ed. "Q.A.J."]

PRINCIPLES OF PRUNING.

PEACHES AND NECTARINES.

"No pruning is bad, but bad pruning is worse, while 'good pruning is manure.' There is no way to do good pruning but to do it with a thorough understanding of its object. The fundamental facts in pruning are these: The tendency of the tree is to produce more buds than ever grow into branches; more branches than can produce good fruit; more fruit spurs than bear; more leaves than can find proper exposure to light; more flowers than set fruit, and more fruit than can be developed according to the standard of size and quality desired by the grower. 'Man's shrewdness consists not in following Nature, but her hints, and, going further, intensifying natural processes for quick and magnified results.'"

The fruit of the peach and nectarine is principally produced from one-year-old wood, but also spurs.

That in continuation of a branch is termed an extension; that issuing from the side of a branch is called a bearing shoot.

A bearing shoot (M) is usually best furnished with blossom buds on 8 to 12 inches of the first made and ripest growth, and becomes attenuated towards its extremity. This part is worthless for the production of fruit, and, therefore, must be shortened to a growth bud. On thoroughly ripened wood the shoot (M) is pruned to 12 inches, but a wood bud is left at its extremity, and another at its base.

Plate XIV.



THE "GOOTEE" METHOD OF PROPAGATION.

SUMMER PRUNING.

The bearing branch (P) is shown at the disbudding stage. This important operation is generally performed when the fruit is set. The shoots marked (t) are rubbed off by degrees so as not to cause a check, but one at the extremity (u) is retained to attract the sap to the fruit, and is pinched to three leaves, not counting the two small basal leaves; another shoot (v) is reserved at the base of the bearing branch, which makes a sturdy growth for bearing the following year. Directly the best set fruits are taking the lead in swelling, remove the smaller and ill-placed (w), and when those retained (x, y) are the size of small marbles displace all (x) but two (y) of the best, if for very choice fruit, situated on the front or upper side of the branch for ripening.

Further summer manipulation is shown in (Q). The bearing branch growth, after being stopped at (a), pushes laterals (c), from which, after pinching, sub-laterals (d) proceed, and are stopped at every joint as made. All other growths from the bearing branch are suppressed, and when the fruit is gathered the branch is cut out at its base (the bar). The successional bearing shoot is trained-in, but when vigorous and certain to encroach on other growths it must be stopped about 14 inches from its base (b), subsequent growths (c) being stopped at one joint of growth, as shown, by nipping off the point (e). Other laterals may push as at (f), but are more clearly shown in (R), stopped at (g), and if the shoots incline to grossness the leaves may be half shortened (bars); this assists the formation of blossom buds in the axils of the leaves (h), the point of winter pruning.

Under judicious summer management very little pruning is required in winter, and the figure with references to (S) show all that is required. The main thing is to avoid overcrowding, which is ruinous to the trees.

In pruning full-sized or old trees, it is desirable to remove the weak, bare, and misplaced branches, and train-in new and better wood.

DISBUDDING.

Its object is to encourage the enlargement of the fruit, and make provision for the succeeding year's crop by the removal of all superfluous shoots at an early stage. Over-crowding must also be prevented by pinching refractory laterals and unruly growths, so that the wood and fruit will receive the needful light and air to ripen them.

THINNING THE FRUIT.

More fruit than it is advisable to allow to remain generally set on peach and nectarine trees. Thinning should commence when the best fruits approach the size of marbles, and finally, for stoning, when the size of pickling walnuts. These operations should be effected gradually, leaving the fruits thinner on the weaker parts of the tree, and more numerous on the stronger, always reserving those for the crop on the front or upper side of the branches. One fruit to a square foot of the surface covered by the tree is enough to leave for securing the finest specimens. Habits of bearing must have due weight with growers in thinning the different varieties of peaches and nectarines. The health and management of the trees also influence the crop materially. A vigorous tree will not be distressed by one-third more fruits than one of medium strength, or twice as many as a weakly tree. Two fruits to a square foot form a maximum crop of large peaches or nectarines, and more than three fruits of the medium-sized kinds to a superficial foot of surface ought not to be exceeded on healthy, well-supported trees to secure fruit of full size and high quality. Over-cropping exhausts the trees quickly; therefore the cultivator must exercise judgment in thinning the fruit, acting in strict accordance with each tree's manifest condition. In removing the fruit it is necessary to give it a twist and press it in the opposite direction, to avoid tearing the bark, as would be the case if it were pulled off towards the base of the branch.—“Fruit World.”



PROPER AND IMPROPER PRUNING BUDS—DISBUDDING AND THINNING—WINTER AND SUMMER PRUNING.

References:—Proper pruning buds: (F) wood buds, (G) double buds—(p) wood bud, (q) blossom bud. (H) triple bud—(r) wood bud, (s) blossom buds. Improper pruning buds: (J) single blossom bud. (K) double blossom buds. (L) triple blossom buds. (M) bearing shoot shortened. (P) bearing branch after the fruit is set—(l) disbudded shoots, (u) growth to attract the sap to the fruit, pinched, (v) successional bearing shoot, (w) fruits removed at the first thinning, (x) fruits removed at the second thinning, (y) fruits left for the crop. (Q) bearing branch and successional bearing shoot, showing—(z) fruits stoned and leaves drawn aside, (a) shoot above the fruit, pinched, (b) point of stopping the successional bearing shoot, (c) laterals pinched, (d) sublaterals stopped, (e) part to be removed at pinching, (f) lateral on the successional bearing shoot, stopped. (R) lateral from extension—(g) point of pinching, (h) point of winter pruning. (S) winter pruning, showing—(i) point of removing the bearing branch when the fruit is gathered, (j) point of shortening the successional bearing shoot, (k) point of cutting off lateral, (l) proper position for the bearing branches, (m) right place for training the successional bearing shoots, (n) latent basal buds, (c) taking second successional shoot from the base of a bearing branch—a bad practice.

A FEW HINTS ON STRAWBERRY-GROWING.

By WILLIAM FRENCH.

The strawberry belongs to a genus of low perennial stemless herbs, with runners and leaves divided into three leaflets; calyx open and flat, petals five, white; stamens ten to twenty, sometimes more; pistils numerous, crowded upon a cone-like head in the centre of the flower; seeds naked on the surface of an enlarged pulpy receptacle called the fruit.

The strawberry belongs to the great rose family, and the name of the genus is *Fragaria*—from the Latin, *fraga*, its ancient name.

Fragaria vesca is the wild strawberry of Europe; *Fragaria californica* is found growing on the mountains of California; and another variety, *Fragaria chiliensis*, is also found growing wild in Upper India, and is also found wild in Germany.

Therefore, by cross-breeding and fertilisation, those wild weeds, as you might call them, have been raised in thousands of varieties, and to-day the cultivated strawberries rank as one of the leading first-class fruits of the day, and I believe they can still be greatly improved in size, flavour, and productiveness, by which, instead of giving us a harvest of six months' picking, they can be brought to fruit for eight or nine months. Taking into consideration the small plants and the amount of fruit they produce, I consider them a marvel, but "much always wants more." How the name of strawberry came to be applied to this fruit is unknown. Some say it was because children used to string them upon straws to sell; others believe it arose from the practice of placing straw around the plants to keep the fruit clean. But there is nothing conclusive on this point. The strawberry does not appear to have been cultivated by the ancients or even by the Romans, and it is only within this last hundred years that there has been any improvement in the varieties under cultivation.

FIELD CULTURE.

SOIL AND PREPARATION.

In my opinion, the main point to be observed is to secure a depth of soil with good drainage and plenty of nutriment for the plants. If planting in new soil, give nothing less than two ploughings, say 4 inches deep. After the first ploughing allow the land to lie exposed to all weathers for a month or two, after which give a good harrowing across the furrows, and after a few days run the roller over to break all lumps, the reverse way of harrowing. Then give a second ploughing, nothing less than 8 or 9 inches, or deeper, if possible. Better still, run the subsoiler after the plough, as I find it to be of great advantage in allowing the roots to penetrate deeper, and also in retaining moisture against dry spells.

Let it lie for a week or two exposed to the atmosphere. Then, after a shower, roll again, and, if required, harrow again, to make sure that the soil is properly pulverised, as this is, I consider, the foundation of success, and therefore a most important point is to have the soil under proper tilth, or, as the saying is, to have the soil like an ash-heap, so that the roots of the plants can lay hold of the soil at once after they are planted. If the soil is left rough and lumpy, the roots cannot get to work. Therefore, after a few days of wind and sun the plants are parched up, and hence the aggravating work of filling up misses, which I consider is very disheartening and a serious loss of time. New soil is greatly improved by growing a crop of fodder, say oats, barley or cow-pea, which, if not required for feed, can be ploughed in as a green manure, by which means you will find your soil will work as mellow again.

SMALL GARDEN CULTURE.

Trench the beds about 5 feet wide and 18 inches deep. If the subsoil is of a clayey nature, leave it at the bottom of the trench, but if fairly good mix it with the top spit along with plenty of vegetable matter, rubbish, &c. Let

it lie for a month or more to mellow. Then fork and pulverise well until the soil is free from lumps. Now let it rest for a week or two. If farmyard manure is procurable, scatter it on the surface 2 or 3 inches thick, and fork it in well, so as to mix the soil and manure thoroughly. In a fortnight it will be ready for planting. Plant four rows in a bed. By having narrow beds, trampling upon the planted soil is avoided. Set the plants about 1 foot apart in the rows. Planting close in the garden necessitates replanting every year, whereas in field culture more room is given. Several varieties can stand for two years giving good results, by keeping the soil between the rows constantly cultivated, which I maintain must be done if good results are to be obtained.

PREPARING FOR PLANTING IN FIELD.

My plan is to draw out drills with the plough as deep as possible about 2 feet 6 inches apart, and put the manure in the trench. If artificial manure is used, draw a long-toothed rake along the furrow to mix the manure and soil well together. This is not necessary with farmyard manure; merely run the Planet-Junior between the drills to cover in the manure, and leave it as level as possible. If this latter point is not attended to, you will find that after heavy rain the plants in the hollows will be buried with their crowns too deep, and consequently they will be weeks before they make a start into growth.

MANURES.

The strawberry is a plant that will not refuse a fair amount of manure, providing it is presented in a proper form. My experience is that the plants make a start into growth much quicker, and are well-established before the winter, where I use the farmyard manure, but I am sorry to say it is too scarce. The principal manure I use to plant on is bonedust, at the rate of about 10 cwt. to the acre. I find that by putting the manure well down below the surface it greatly encourages the roots to strike downwards, and the lower they get down the more moisture they obtain, and are thus not affected by the heat and drought half so much as when the roots are encouraged close to the surface. After the first crop is gathered I mix my own fertilisers, consisting of superphosphate, sulphate of potash, and sulphate of ammonia, in the following proportions:—Two parts superphosphate, 2 parts sulphate of potash, and 1 part of sulphate of ammonia. Make sure to break all lumps so as to have it well mixed, as this is an important part. I have a small hand plough, which I run along the rows, and it makes a furrow about 2 inches deep. Sow the mixture in the furrow, and by running the plough the reverse way it covers over the manure.

PLANTING THE STRAWBERRY.

While it is impossible to fix a hard-and-fast time to transplant, as the seasons differ so much, I shall have to leave it to the grower's own judgment. If your ground is in good order and the weather showery, you can start on the 1st of March. I also prefer young runners. Some growers say they get the best results from old crowns split up, but that is not the case with me. I plant about 2 feet 6 inches between the rows and from 1 foot to 18 inches in the rows, to allow the horse and scuffler to go between the rows, so as to keep the soil always open, which I consider of great importance. In transplanting, some recommend shortening the roots by one-half. I consider this practice all right in the cooler countries, where the ground is, practically speaking, always moist and cold below; it is also a good practice in cases where the roots are allowed to get dry or are injured in any way. In such cases a clean cut would, in my opinion, be beneficial. My way of planting is to allow the roots to hang down straight in the hole, the deeper the better on account of coolness and moisture, provided the crown is not smothered. Some cultivators use a dibble for planting, making a round hole, into which the roots are thrust in clumps. Others just scratch a handful of soil off the surface and plaster it back on the

roots, the latter lying in a horizontal position, instead of hanging perpendicularly in the hole. Plants might live under such treatment, providing we had showers every day, but careful planting with a trowel is far the better way.

VARIETIES THAT DO BEST WITH ME.

Aurie.—This was planted at the end of February of this year, and we were picking fruit off them on 23rd April. The berry is large, well-flavoured, and of fine colour. It carries well, and is good for box and factory. No disease has appeared on it.

Glenfield Beauty.—Of good robust habit; good both for box and factory, providing they are allowed to ripen properly. They commence to ripen in June, are very prolific, and prefer heat and moisture.

Trollope's Victoria.—An old favourite, rather late compared with the later and locally raised varieties, producing good box fruit; useful also for the factory. My experience is that it is shy in bearing in a moist season. If anyone is planting this variety, I should advise them to keep it on the high ground.

Annetta.—Previously known under the name of "Butt's Seedling." It is rather erratic in bearing. During some seasons it does splendidly, at others the reverse. Last year I did well from one patch, whereas another lot gave poor returns. This year I have 5,000 or 6,000 looking splendid and showing good fruit.

Marguerite.—Good for the first of the season, but after giving a good first crop it cannot be depended upon for the remainder of the season.

Federator.—This variety is like the Glenfield Beauty. It produces a splendid crop in a good moist season, but stands a heat wave very badly. It prefers a low, moist position.

Pink's Prolific.—Good for a private garden, but too small and late for a large area.

Noble.—Good for an early variety, producing a splendid large and good-coloured berry, but a short cropper.

With several others, including "Made to Order," one Mr. Pink crossed between Aurie and Trollope's Victoria. At the time of planting, the weather was all that could be desired. A good cropper, also free from disease.

Usher's Special, also *Phenomenal*.—The last two varieties I have not had in my possession long enough to say much about, but they are promising. Also one imported from America is of splendid colour, flavour, of good size, with splendid promise.

PROFITS OF STRAWBERRY CULTIVATION.

Persons who have had no experience in raising strawberries for market are desirous of ascertaining in advance the prospects of profits on investments. Unfortunately for the would-be investor, results depend greatly upon circumstances, such as markets within reasonable distance, plenty of labour at moderate prices when needed, land at reasonable prices, also fertilisers, and favourable season. The greatest profit made in the cultivation of the strawberry is by small growers within a moderate distance of the towns, who have children to assist in gathering the fruit when needed. An acre of strawberries under high cultivation, with the fruit gathered and marketed in the very best condition, will often yield more clear profit to the grower than 10 acres under opposite conditions.

MULCHING.

Forest oak leaf makes a splendid mulch when procurable. If not, half-decomposed leaves would keep the fruit clean from grit, and also do a great deal of good in furnishing the plant with humus, which is a favourite of the strawberry.

Referring to planting old crowns, I have been making a further test this year with the Marguerite and Trollope's Victoria. A very good variety for

colour. Then they took about a month longer to establish themselves than the young runners. Therefore, if the weather is dry, they are very unsatisfactory. Yet they came into fruiting first with a very light crop.

A FEW REMARKS ON SMALL FRUITS.

I consider there ought to be something done regarding the fixing of prices. For instance, for, say, jam berries, prices should be a little more regular than at the present time, so that growers and manufacturers could work with more confidence together, instead of carrying on this cut-throat competition, the outcome of which is certain to grind the hard-working tiller of the soil down, until eventually he is forced to give up growing the small fruits and take to growing large fruits, where less labour is required for cultivation and marketing. I consider this evil could be overcome to a great extent by a conference between manufacturers and growers, considering the demand for this fruit is about 400 per cent. higher than the supply, taking a manufacturer's own statement for it, and also the scarcity of same on our local markets.

STRAWBERRY INSECTS AND DISEASES.

Crown Borer (*Tyloclerma fragariae*, Riley), White Grub.—One-fifth of an inch long, boring into the crown of the plant in midsummer. The mature insect is a curculio or weevil. In reference to this pest, to the best of my belief, Australia is free from it.

Remedy.—Burn over the field after the fruit is picked. If this does not destroy the insects, dig up the plants and burn them.

Strawberry Leaf-blight, Rust, or Sun-burn (*Sphaerella fragariae*, Sacc., including *Ramularia*).—Small purple or red spots appearing on the leaves. These eventually become larger, making the leaf appear blotched. Most serious after the first crop of fruit is picked.

Remedies.—Spray with Bordeaux mixture at intervals of two weeks, as soon as the fruit is picked. The leaves are easily destroyed, without injury to the plants, by quickly burning off a thin layer of straw, which is spread over the patch after the fruit is off.

I am pleased to say that we have several varieties, practically speaking, free of this disease. This includes also our locally-raised ones, which I have already made mention of.

The strawberry, as indeed all plants, takes certain substances from the soil—viz., “manurial ingredients.” These may be defined as those substances from which the plant derives its supplies of nitrogen, phosphoric acid, and potash. Now, it must be remembered that all plants require adequate supplies of these three manurial ingredients, but different plants require them in different proportions.

For example, sugar cane requires a great deal of potash, relatively little phosphoric acid, and much nitrogen.

An acre of strawberries will contain—375 lb. potash, 222 lb. nitrogen, 83 lb. phosphoric acid.

In 7 tons of farmyard manure there will be an average of—74 lb. potash, 77 lb. nitrogen, 57 lb. phosphoric acid.

Compare these figures, and it would be seen that farmyard manure would be a badly-balanced fertiliser for strawberries, because in order to supply sufficient potash considerable excess of nitrogen would have to be supplied, and a very large excess of phosphoric acid; so that it would appear as if a much more economical manurial dressing could be prepared if, instead of farmyard manure alone, a combination of farmyard manure and artificial be used. But where farmyard manure can be produced on the farm, then, for a first crop, it is preferable to all other manure.

For strawberries, when farmyard manure cannot be obtained, a good dressing consists of—3 cwt. bone-dust, 3 cwt. superphosphate, 1 cwt. dried blood, $\frac{1}{2}$ -cwt. sulphate of ammonia, 2 cwt. sulphate of potash per acre, or in these proportions.

Horticulture

FLOWER GARDENING, No. 7.

By THE EDITOR.

PLANTS SUITABLE FOR OUTDOOR CULTURE.

PENTSTEMON.

Amongst popular hardy plants, few surpass pentstemons for their usefulness and ornamental character in the mixed border or rock-garden, or for planting in beds by themselves. Many of the species are very attractive, and are indispensable in the choicest collection of herbaceous plants, and a selection of the numerous improved varieties is equally valuable for garden decoration and for cut flowers. They bloom very freely for several months in the year, and are exceedingly hardy.

Pentstemons are very varied in colour. They may be propagated either from seeds or cuttings, the latter method being adopted if it is required to perpetuate species or named varieties. Seeds should be sown in boxes of light soil in autumn or spring, and, as soon as they are large enough to handle, pot them off singly, and leave them until they are well established, and then plant them out in borders in the open.

Notwithstanding their hardiness, they are very susceptible to wet and frost, especially to the former. It is, therefore, very important that the land should be well drained. For enriching the soil, the best compost is leaf mould, mixed with decayed manure and some sandy loam. A good mulch of 2 or 3 inches of stable manure applied in the spring will also greatly stimulate the growth of the plants. Through the summer, the plants will require plenty of water, but very little in winter. Old plants, kept outside, should be covered in autumn with ashes, or they may be divided and replanted in the same or different borders.

Some years ago, the National Agricultural and Industrial Association of Queensland offered two medals to the owners of the best flower gardens in the neighbourhood of Brisbane, the gardens to have been planted and kept up by the owner without any outside help. I happened at the time to have a splendid assortment of pentstemons in my garden, so I entered it for competition, and had the satisfaction to gain one of the medals. I was told afterwards that it was the pentstemons which contributed mostly to my success.

VARIETIES WORTH PLANTING.

P. Murrayanus—Scarlet; *P. Coboea*—White and blue; *P. Irvine's* new Hybrid—Various colours, flowers extra large; *Alba*—Pure white; *Alexander Pflaum*—Deep lake, white throat; *White Beauty*—Pure ivory white, tinted rose; *Clara and Clio*—White bordered with purple; *Emblem*—Rosy scarlet, white throat; *Perle*—Pearl white; *Neron*—Purple, white throat; *Georges Sand*—Veined white lips, tube bright purple; *Cardinal*—Brilliant scarlet, large flower, and many other beautiful varieties which are catalogued by nurserymen.

CLIANTHUS AND NOVELTIES.

Regarding *Clianthus*, or Glory Pea, I will quote from the Cyclopaedia of Horticulture, and possibly this information may help to make a success in growing it.

Clianthus Dampieri is anything but easy to grow in the latitude of Brisbane. Red spider is its greatest enemy, but too much moisture in the soil, followed by hot sun, is equally fatal to it. In a sandy soil when the seeds are sown early in spring, the plants during ordinary summers make a very fine display. The plants will not bear transplanting. Even when they are grown in pots, it is a risky piece of work to shift from small pots into larger ones.

SWEET PEAS.

As a hardy annual, there is nothing finer than the sweet pea, and where its cultivation is properly carried out the flowering season may be very much prolonged.

The soil for this beautiful plant must be very rich, and, if it is not naturally so, it must be well fertilised by working in thoroughly rotten stable manure in the summer previous to sowing the seed. The soil should also be left open to sun and air until the time for sowing the seeds comes round, which will be from February to March and even on to May and June; but, in very cold districts, it is better to defer the sowing until spring. By sowing in autumn, however, strong plants will be produced before the winter, which will resist any moderate winter cold. The seed may be sown, either in rows some 6 or 8 feet apart, to form a hedge, or in colour groups, using a large inverted pot, and sowing the seed round the impression made by the rim, keeping the seed, in the latter case, a good distance apart. As soon as the seedlings are an inch or two above the soil, they should be firmly staked, using sticks of dead brushwood for the vines to scramble over. It is always advisable to use a light mulching, as this prevents the moisture in the soil from evaporating, should very dry weather be experienced in late spring. Rotted leaf mould and well-rotted horse manure are as good as anything. This mulching will save a good deal of labour in the matter of watering, which, in very dry weather, does more harm than good by causing the soil to bake and harden. The after treatment of the plants merely consists in keeping the flowers picked to prevent the formation of seed, and by this means the flowering season is much prolonged. When they begin to show signs of exhaustion, go over them with the shears and top them. This will induce them to make new growths, from which flowers will continue to be produced for some time. In addition to the annual, there is the hardly less beautiful perennial or Everlasting Sweet Pea, which is most effective when planted as a hedge. J. Cronin, Principal of the School of Horticulture, Burnley, Victoria, writing on the cultivation of the sweet pea, says:—"The perennial kinds are propagated from seeds, divisions, or cuttings of the young shoots in spring under a bell glass. Seeds should be sown in pans or boxes early in summer, and may be transplanted in the following spring. *Lathyrus latifolius* and its varieties do not produce seeds freely, so propagation from divisions and cuttings is resorted to as a certain means of increase. Cuttings when rooted may be grown in pots for the first season, or may be planted at once where it is intended they should grow. They produce their growth during spring, bloom during summer, and die down to the ground during autumn. They are suitable for clumps in the gardens, and for covering a trellis or breakwind. A deeply-worked well-drained loam is suitable, and they may remain undisturbed for several years. *Lathyrus pubescens* is raised from cuttings or seeds. Plants from pots may be set out at any time during the season of active growth. They thrive best in a stiff loamy soil, and require a position on an open trellis, where the shoots should be trained as growths develop. Many of the older varieties of sweet peas are unworthy of culture in comparison with new varieties of the same colour, and may be discarded with advantage, as the seeds of the better varieties are offered at cheap rates. A good collection should include Helen Lewis, Gladys Unwin, Mrs. Alfred Watkins, Nora Unwin, Frank Dolby, Queen Alexandra, Evelyn Byatt, Romolo, Piazzani, Black Michael, Helen Pierce, Henry Eckford, E. J. Castle, Countess Spencer, Mrs. Walter Wright, Miss Willimott, Black Knight, John Ingman, Dorothy Eckford, Hon. E. Kenyon, Navy Blue, and Earliest of All, the latter being the earliest sweet pea. Perennial kinds:—*Lathyrus latifolius*, and the white variety *albus*, Pink Beauty, *splendens*, *grandiflora*, and *pubescens*."

PHLOX.

In this genus, there are some twenty-seven species, some tall, some dwarf, some creeping, others erect, some annual, and some perennial. The perennial species and varieties of phlox are some of the best and most popular of garden

plants. They are all very easily cultivated, and are practically within the reach of everybody. The dwarf-creeping species are very suitable for the rockery or front line of a mixed border. None of the dwarf species seed freely; they are propagated chiefly by means of cuttings or divisions. The perennial (*decussata*) is quite a different section, producing spikes of flowers some 2 feet in height; it does not, however, usually flower the first season from seed. For increasing new or scarce varieties, cuttings may be made from pieces of root. These may be cut into short lengths, and treated somewhat like seeds. Propagating by division simply consists in lifting the plants in early spring, cutting them at the base into small pieces, and replanting. These tall-growing perennials succeed best in rather heavy soil, and where it is of good depth; they will, however, thrive fairly well in any good border or bed. A thick top-dressing of manure in summer is of great help, both by preventing evaporation and affording nutriment. If the weather is dry, a heavy drenching of water occasionally is also recommended, as it tends to prolong the flowering season. The plants are very attractive in beds by themselves or in mixed borders along with other perennials. They are also well adapted for culture in pots, if provided with a rich soil, and grown in a cool, slightly shaded frame, through the summer.

Among the phloxes, the *Phlox Drummondii* must take a first place, as it has everything to recommend it. If sown in the autumn, it will flower in the winter, and continue to flower for several months. A later sowing in early spring will give plants which will bloom throughout the summer, and, if planted in beds, will produce a most dazzling effect, as the plants are simply covered with flowers which often entirely hide the foliage. Plants which have been flowering during the summer are sure to seed and produce a host of seedlings, which can be planted out when the weather is favourable.

The seeds should be planted in pans or boxes in spring or autumn, in light, rich soil. As soon as they are large enough to handle, they may be planted out in light, rich soil. Plant the dwarf kinds about 8 inches apart; the others at least 1 foot apart. Mulch and water when the weather is dry, and thin out the weakest shoots when the plants have become large.

SOME GOOD VARIETIES.

Grandiflora alba—Pure white; *Grandiflora*—Dark purple; *Grandiflora*—Scarlet; *Grandiflora stellata splendens*—Pure white, with stellated centre; *P. cuspidata*, *Nana compacta*—Dwarf; Great Gero—A very dwarf variety, flowers of all shades and colours; Semi-double—Very free-flowering, producing semi-double flowers of all shades and colour, and remaining a long time in bloom.

NARCISSUS OR DAFFODILS.

The narcissus thrives well in Southern Queensland, yet these beautiful, sweetly-perfumed flowers are seen in too few gardens. Whilst they require a certain amount of care, they are very easily grown. The chief cause of failure is late planting, irrespective of variety. Some varieties may be planted as late as May or June, without any appreciable falling off in quality or quantity of blossom; while there are others—the *Poeticus* section, for instance—that can hardly be planted too early. The best results with these are obtained by planting in March or perhaps in February. The depth at which narcissi should be planted is important. It will vary with the size of the bulb. A good old English rule is that all narcissi bulbs should be covered with soil, once and a-half their own depth, measuring from the collar of the neck to the actual base.

The best soil for these bulbs is a nice moist sandy loam, but they are not at all particular as to soil, and may be left alone for several years after planting. Some, indeed, like a rather deep and somewhat stiff soil, and, if the position is one partially shaded from hot sunshine in spring, the flowers of some of the species retain their beauty for a much longer period than they would if exposed to all the light and sunshine possible. Narcissi are well

adapted for planting by the sides of creeks and waterholes, and in mixed flower or shrubbery borders. They are also suitable for naturalising, in any quantity, in the grass, by the sides of walks—in fact, in any position where they may be readily seen on their appearance in the spring. Many people transplant the bulbs annually, but this is not at all necessary, nor, indeed, desirable. The foliage should not be cut off when green, but allowed to die naturally, and then be removed.

On no account should the bulbs come in contact with crude manure, or they will assuredly be injured. Where manure is rendered necessary by the poorness of the soil at the time of planting, it should be well rotted, and placed at such a depth that the roots of the bulb do not run into it. Growers should take care that the bulbs rest upon the soil, and are not “hung up.” Plenty of water is essential in the growing season, and the flowers are always more beautiful in a moist season than in a dry one. An important matter in growing the narcissus, and one that is but imperfectly understood is “Lifting.” Some growers lift their bulbs every year, even before the leaves have matured. This is a fatal mistake. Only certain varieties may be lifted annually, and even these need not be moved. Many may be left for years, until the soil is so exhausted that the plants show decided deterioration. Then the whole batch should be lifted. It is an excellent plan to move the bulbs to an entirely different location, as a change of quarters makes a wonderful change for the better in their recuperative power. All experienced bulb-growers are aware of this, and periodically change the narcissi stock when they have trial grounds in two widely different parts of the country.

Lifting must always be done with care, and the best time for the operation is when the foliage has attained the yellow stage preparatory to decay. Where only just a change of quarters is required, as in the average garden, the bulbs, after lifting, should be carefully dried in a cool, airy shed. As soon as they are properly dry, any offsets large enough may be separated from the parent plants, either by pulling them apart or by cutting. Drying narcissi bulbs indiscriminately is a very bad practice. As a general rule, lift, divide, and plant out at once.

There are some varieties which are best naturalised, because they cannot be persuaded to grow or bloom as border plants. These should be planted in grass plots. The English Lent Lily, the beautiful Pallidus Praecox Scoticus, Spurius, are never so happy as when planted in the meadowlands of the old country. Once a stock of these is planted in the grass they will soon increase by means of seed. When planting bulbs in grassland, they may be dibbled in with a crowbar, or a better plan is to take the grass up and prepare the soil underneath.

SPECIES.

In scientific lists the species and varieties are divided into sections, and these again into groups. The sections are:—HOOP PETTICOAT DAFFODILS, TRUMPET DAFFODILS, CHALICE CROWNED, and POET'S DAFFODILS.

Group I.

Magni-coronatae—This group contains the largest Trumpet Daffodils.

Group II.

Medii-coronati, or Chalice-cupped Daffodils (*Narcissus incomparabilis*).

Group III.

Parvi-coronati (Dolly Cup, or Small Crowned Daffodils).

SOME GOOD VARIETIES.

Magni-coronatae.—Golden spur—Deep soft yellow; early. Henry Irving—Broad, spreading yellow perianth; large yellow trumpet. Emperor—Perianth, deep primrose; trumpet, rich yellow. Bi-colour (of Howorth)—Perianth, white; trumpet, primrose; late. Maximus—Rich, deep golden yellow; perianth elegantly twisted; one of the best. Mrs. Walter Ware—Perianth, white; trumpet, golden; expanded at brim and frilled; one of the

finest bi-colours. William Goldring (The Swan's Neck Daffodil)—Long, snow-white, tapering, and twisted perianth, gracefully drooping over the primrose trumpet; a very elegant daffodil.

Medii-coronati.—Sir Watkin (the Giant Chalice-cupped Daffodil)—Handsome bold flower; perianth, sulphur; cup, yellow, slightly tinged with orange; a good cutting flower. *Narcissus Barrii*, *Narcissus Leedsii*, *Narcissus Nelsonii*.

Parvi-coronati.—(Dolly Cup, or Small Crowned Daffodil)—*Narcissus Burbidgei*. Vanessa—Clear yellow, small, flat cup; free bloomer. *Poeticus* (Pheasant's Eye)—Perianth, pure white; cup, citron. *Poeticus ornatus*—Perianth, pure white, broad and well-formed; cup, margined scarlet. *Poeticus plenus* (Gardenia-flowered)—Double, pure white, highly fragrant.

Double-flowering Narcissi.

Orange Phoenix (Eggs and Bacon)—Beautiful large, double white flowers, with rich, orange scarlet segments in the centre. *Telemonius plenis* (Double Daffodil)—Deep yellow flowers, large and very double.

Single and Double Jonquils.

Odorus (Campernelle Jonquil)—Perianth and cup, rich golden yellow, several flowers on a stem. Jonquilla (Single Jonquil)—Deep yellow. Tenuior (The Silver Jonquil)—Sulphur white, yellow cup.

Polyanthus Narcissus.

(Tazetta, or Bunch-flowered section.)

Double Roman—White, with orange centre. Grand Monarque—White, clear, yellow cup, very large spikes. Dubius or Paper White—Pure white, a good early variety for cut flowers, and valuable for scent-making. Grand Soleil d'Or—Yellow, orange cup.

CHINESE SACRED LILY.

One of the very best species of *Narcissus* is a sub-variety of *N. Tazetta*, known in horticulture as *N. Tazetta*, var. *orientalis*. It is usually grown in the same way as a hyacinth—in a bottle of water. But it is perfectly at home in the open ground.

A single bulb in a bed, thirteen or fourteen years ago, has never been disturbed, and has had no special care, merely a little fertiliser at long intervals and grass kept away part of the time.

The one bulb has increased to twelve. Seven of these have bloomed this spring, each stem bearing from six to thirteen beautiful white flowers. Looked at from one side, the clusters of blossoms seem to be pure white. But it is not, for the tiny crown in the centre of each bloom is light lemon colour. With better care it would doubtless be more prolific of flowers. Yet all the family are well suited for the gardens of those who have little time or strength to devote to their flower beds, for they will stand neglect better than anything we know of except crinums and roses.

ATTAR OF ROSES.

This delicious perfume, which at one time used to be sold at a guinea a drop, may be obtained as follows:—Gather a quart of rose leaves from fragrant roses after the dew is all off. Do not pick them soon after rain, as they are not so fragrant then. Put a layer of the leaves at the bottom of a wide-mouthed glass bottle, sprinkle with salt, and then cover with a layer of absorbent cotton made wet with pure olive oil, another thick layer of rose leaves, sprinkled with salt, and fill the bottle with alternate layers until the bottle is full. Tie a piece of oil-silk (double) over the top of the bottle; set it where the sun will shine on it all day for two weeks; then uncover, and extract the oil from the cotton and rose leaves. It is superior to much of the perfumes which are sold.

Tropical Industries.

THE CULTIVATION OF RUBBER FOR TROPICAL AUSTRALIA.

By HOWARD NEWPORT, F.R.H.S., Inspector in Tropical Agriculture, Cairns, N.Q.

III.—PARA RUBBER TAPPING.

The operation of harvesting is of all cultural operations the one that naturally invokes the most interest, and in such countries as this, and under conditions where labour is at so comparatively high a premium, the facilities with which the harvest can be gathered in and the product rendered marketable or realisable constitute the basis on which the industry will be judged, and, indeed, on which its very existence is founded.

The natural differences in the processes of harvesting are perhaps more marked between the staples of tropical than of temperate countries. The process by which the marketable product is obtained, in the case of rubber, involves a system of cutting or scoring the bark in some manner so that the resulting exudation (the rubber latex) is caught and subsequently solidified. This is technically known as "tapping," which name, however, does not happily describe the operation.

The obtaining of the harvest in this case is certainly very different from that of most agricultural industries at present under cultivation in this country, but because the ideas may seem new and the principles involved unusual and curious, as well as different to anything yet experienced, the subject need not be put on one side as not being worth consideration.

It is difficult, perhaps, to overcome the idea that insensibly prevails among a section of the farming community that what cannot be handled in bulk does not present the same possibility of profit, and it may have been with some such ideas, or the apparent intricacies of the operation, that led one good old farmer, on learning that the actual amount of "milk" from each individual cut, or even tree, was comparatively little, and certainly not as much in quantity per day as he got from one of his Jerseys or Ayrshires, to somewhat contemptuously designate it "a finicking business any way." It is, perhaps, a pity that rubber cannot be harvested with a pitchfork or shovel for some reasons, though, as previously pointed out, the very fact of its smallness in bulk, per value, is one of its greatest advantages as a cultural industry in this country.

Nor is the process of tapping and the subsequent coagulating so intricate as it may seem at first sight—certainly not more so than the making and marketing of butter and cheese, which, indeed, it somewhat resembles.

As stated in the last article on this subject, the period at which the trees may be tapped for their rubber is a matter of size rather than age, the recognised minimum being a circumference of some 15 or 18 inches 3 feet from the ground, and which size may be attained in four years under specially favourable conditions, five years with attention, cultivation, and care, or six years under normal circumstances and no especial cultivation, in North Queensland. The reason why trees of less size than that mentioned should not be tapped is not because of fear of undue reduction of the vitality of the plant, nor even because little or no latex is obtainable, but rather because it has been found that before a tree attains a certain degree of maturity the latex contains proportionately less caoutchouc and more resinous matter, and the rubber is consequently of poor quality.

I also explained in a previous article that the laticiferous system, consisting of ducts or cells in the bark of the rubber-trees, ran nearly vertically, and the

cuts necessary to enable these ducts to be emptied, or as nearly emptied as possible, must consequently be horizontal. Not entirely horizontal either, for then the latex would run over the bark and largely be lost, or at least most difficult to collect, but on a slope, to enable the latex to be caught and collected in a cup or receptacle at one end.

The latex, as such, requires no further description than that given in my first article. A chemical analysis would be of no practical use in this series of papers, and, indeed, an effort is made to avoid technicalities, scientific names, and statistics, in order that these may constitute plain, straightforward, and explicit descriptions of the processes and methods the ordinary average farmer must follow in practically working a small plantation.

By the latex is meant the white, sticky, milky secretion in the bark, that exudes more or less slowly on the bark being wounded.

In tapping rubber-trees it is seldom any cutting is done higher on the trunk than a person can conveniently reach. The trunk of a tree from the ground to a height of 6 or 7 feet, therefore, constitutes what is known as the tapping area.

Various experiments have been conducted in connection with the tapping of the trunk and the lower limbs at greater heights, even up to 30 feet, but for many reasons this has been found unsatisfactory, for in the case of the higher trees ladders cannot be handily manipulated and scaffolding is expensive and cumbersome; and, moreover, it is still a very doubtful question whether the annual production is materially increased thereby.

Occasionally, in some cases, the tapping area may be increased and made to include a few more feet of trunk by means of a short sort of stepladder. It is far more satisfactory, however, to obtain, if it can be done, a tapable stem of not more than 8 or 10 feet in height but of extra circumference or thickness. This is a matter that takes us back to the cultivation of the tree, and is an object which can be materially assisted, if not always attained, by the judicious pruning back or topping of the young tree and encouraging it to branch at a reasonable height, instead of allowing it to grow into a long, tall, and thin sapling.

The modern methods of culture, therefore, will tend towards the production of a broad and thick stemmed tree with a correspondingly large tapping area, just as modern methods of tapping have for their object the obtaining of a maximum regular flow of latex, with a minimum amount of damage to the vitality of the tree.

The old processes of tapping wild rubber-trees in any instances obtained certainly a maximum of latex, but it was at the expense of the life of the tree; in some cases the tree was literally cut down first and then tapped. Whereas it is obviously more advantageous to get a lesser quantity, but get it annually for a longer period, by preserving the life of the tree. The old methods, and, indeed, those still in vogue among the natives collecting many kinds of wild rubber, were the most crude, and consisted of nothing more than an irregular and generally sloping wound in the bark inflicted by an axe, cutlass, or knife, and a clay cup, or sometimes nothing more than a leaf, into or on to which the latex was allowed to drip. These gashes were generally much deeper than necessary, and naturally impaired the vitality of the tree. It was very soon found that deep cutting was, to say the least, unnecessary, because the ducts or cells containing the latex were only to be found in the bark itself, and therefore deeper cuts obtained no more of the secretion than shallower ones.

At the same time, such wounds extending through the cambium or vascular system between the bark and the sap wood, did not heal readily, and ultimately tended to kill the tree, while wounds only in the bark healed rapidly, did not affect the vitality of the tree, and could be opened again.

As the method of tapping became more systematised, the cuts were made lighter, but still a fresh cut was made for each tapping. During this period

these generally consisted of one sloping cut 6 to 12 inches in length, or of two at about the same angle, meeting at a point like the letter V, so that the latex from both could be collected in the one receptacle. Below I give an illustration of this.

Subsequently more modern methods improved on this again, and what may be called progressive tapping was inaugurated, consisting of the reopening of the first cut by taking off a thin shaving of bark from the lower side of it. This, of course, meant an immense saving of bark or tapping area. The next step was to save collecting tins or receptacles, or rather reduce the number necessary, and so, instead of the two cuts constituting the "V" method, a number of cuts were connected thus—

giving rise to what is now known as the half and full "herring-bone" methods. (See Plates XV. and XVII.)

After this came the spiral methods (Plate XV.), consisting, as the name implies, of cuts winding round the tree trunk to the ground, which tapped a maximum area without actually ringing the tree.

Where a tree was substantial enough several such cuts were made, giving rise to the multiple spiral method; and when the distance the latex had to flow was found to be excessive, and it disclosed a tendency to coagulate before reaching the receptacle, cups were placed at more reasonable intervals, and the method called the half-spiral. Several other methods of more or less utility were suggested and tried, such as

the inverted V, thus



&c., but were not found to have any great advantages,

and never became popular.

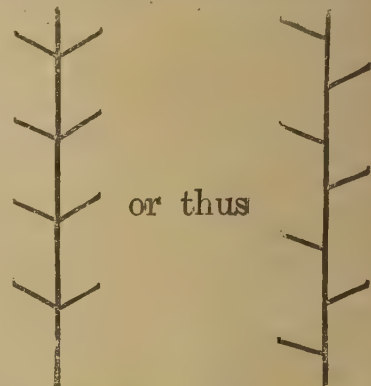
Of these methods, for general purposes, the full herring-bone is the best and most useful, and next to it perhaps the ordinary V. The disadvantages of the V's, however, are in the necessity of fixing the receptacles somehow on the tree, which is apt to injure the bark and render the surface uneven for subsequent tapping, whereas in the herring-bone systems the main vertical channel may be taken to the ground, where the cup may be easily and quickly placed and rest safely. The spiral methods, owing to the amount of walking round necessary, have been found to take somewhat longer to cut or pare, though otherwise satisfactory.

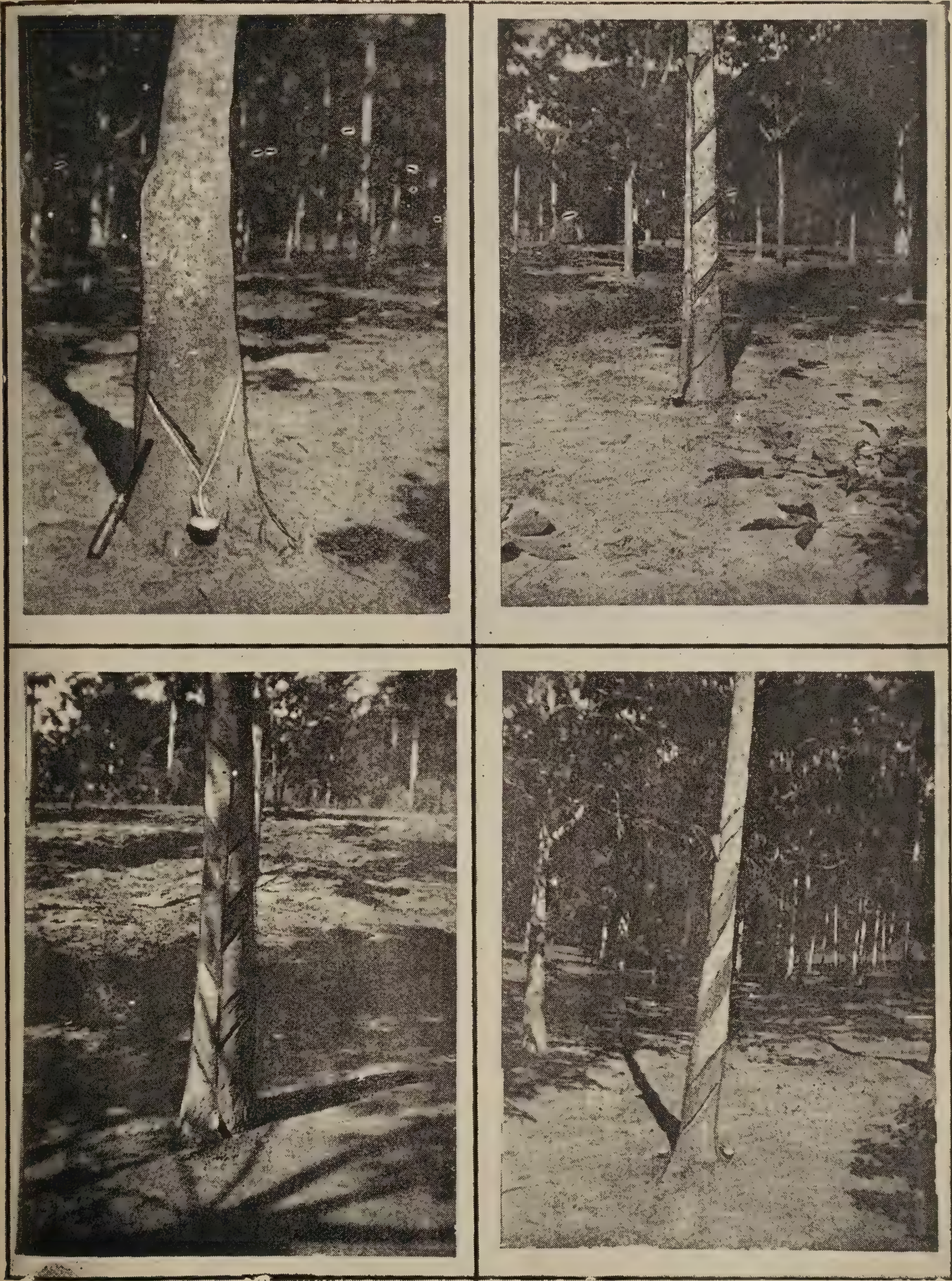
As the processes of tapping evolved from a crude gashing to a delicate shaving of the bark tissues, new and appropriate implements were devised.

To the ordinary pruning knife some sort of a gauge or guide was added to prevent too deep cutting, and it was also found that from the position and angle in which the implement had to be held that something of the nature of a chisel was more expedient and convenient.

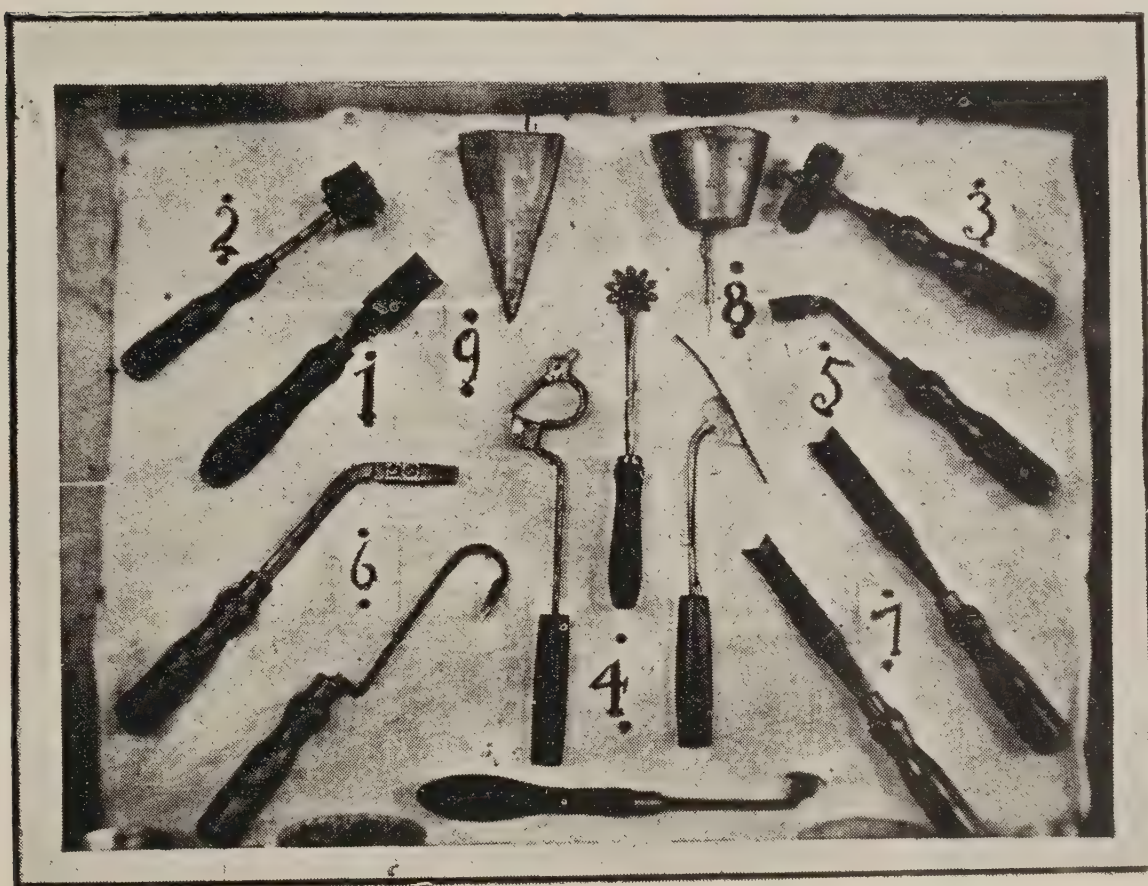
A large number of tapping knives have been put on the market. The principal of these are:—The Pará chisel (1); Mackenzie's knife (2); Macadam-Miller knife (3); the Bowman-Nothway set of tapping implements (4); the safety knife (5); Holloway's (6); and Michie-Golledge's knives (7). The numbers correspond with those in Plate .

The style of these may be gathered from the illustrations, and they may be roughly classed as those having adjustable guards or guides, those with immovable guards, and those with no guard at all. Nos. 1, 2, and 3 come under the first category; No. 4 under the second; and Nos. 5, 6, and 7 as having no guard, and therefore requiring somewhat more skill or knack in using. Besides these, that may be called the regular tapping knives, there are others used more or less exclusively for making the first cut into the bark or opening up. For this purpose, either the hooked Holloway knife (Plate XVI.) or the Bowman-Nothway opening knife (Plate XVI.) may be used; if there be any preference, it is, I think, in favour of the former, as more control can be

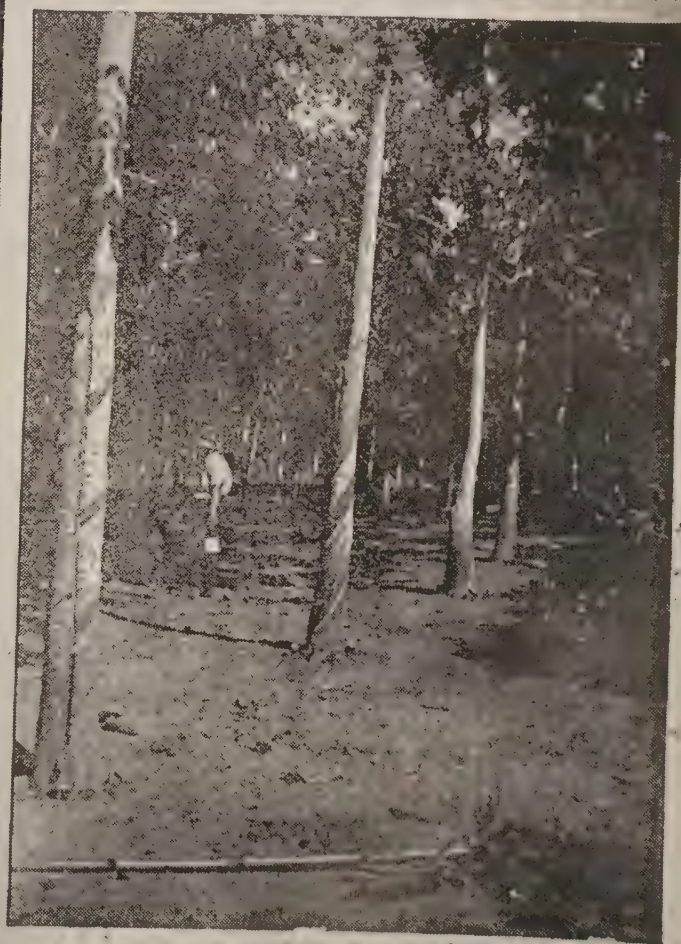
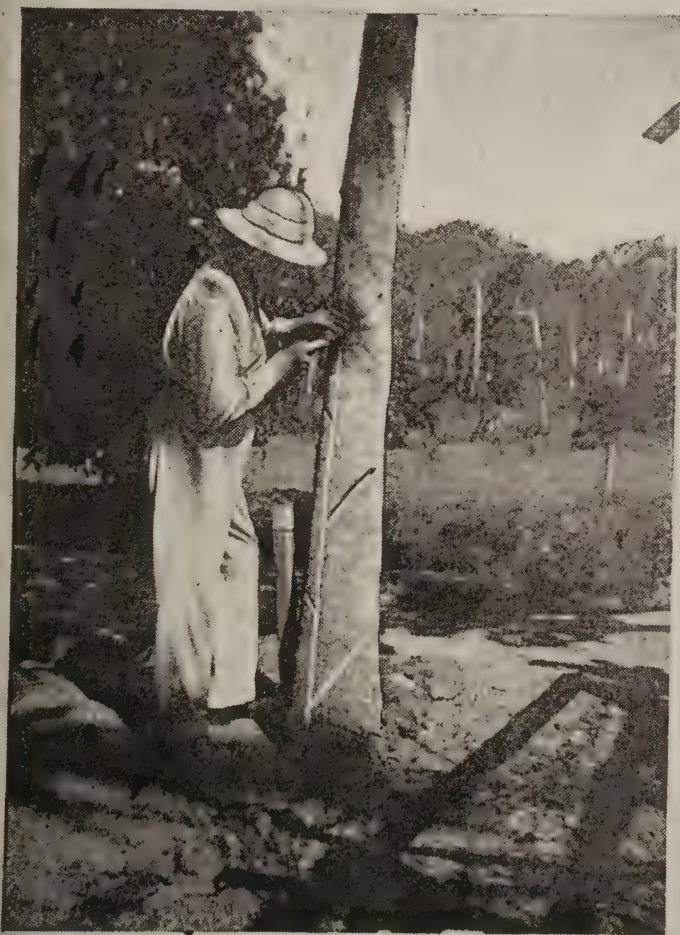
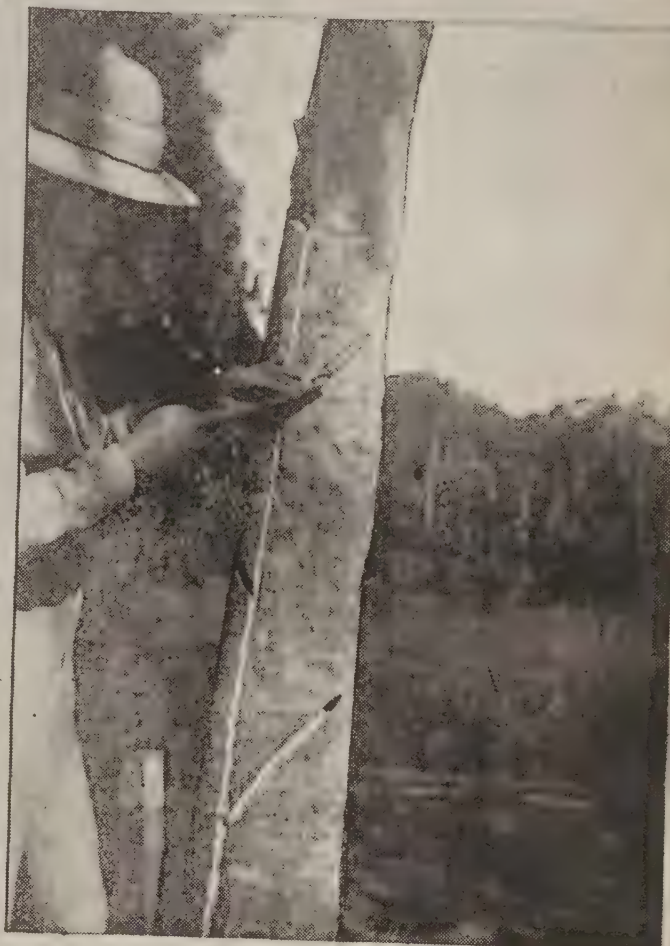
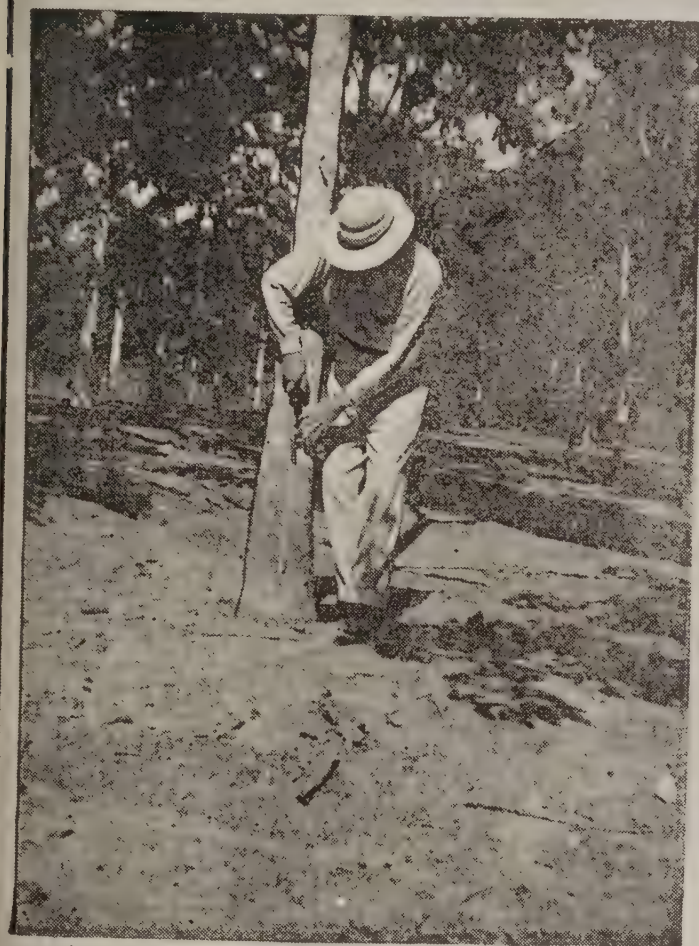




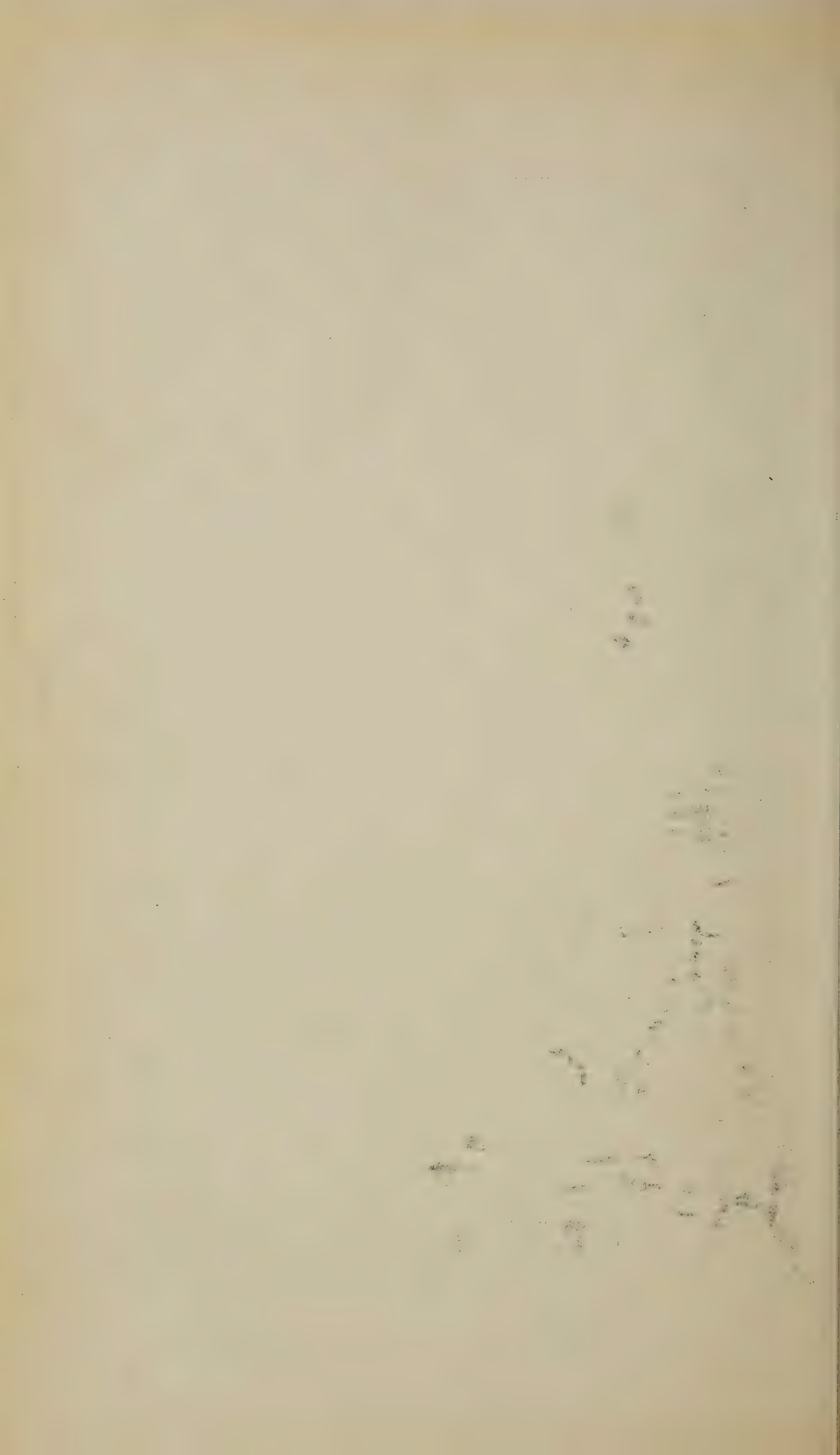
PARA RUBBER TREES TAPPED AT THE KAMERUNGA STATE NURSERY, CAIRNS.

Plate XVI.

RUBBER-TAPPING IMPLEMENTS.



TAPPING PARA RUBBER TREES AT THE KAMERUNGA STATE NURSERY, CAIRNS.



exercised while using it. It might be thought that the knives that had adjustable guards were obviously the best, but it has been found that, while useful at first, the thickness of the bark, not only on different trees but on different parts of the same tree, varies so materially, and so much time was lost in adjusting, that once the knack was obtained no guard at all was necessary, and indeed was almost a hindrance.

Therefore, the simplest knife or chisel has become the most popular, and the last-mentioned, or Michie-Golledge tapping knife, will be found the one most in use and likely to be used.

Having decided upon the method and implement—let us say the full “herring-bone” system and the Michie-Golledge knife or chisel—the first thing for the grower to do is to mark out his trees.

If the modern system of shaving off a thin piece from the lower part of the original cut is to be adopted, which, as explained above, is obviously the best, as giving the maximum returns with a minimum amount of damage to the tree or loss in bark or tapping area, the regularity of the first cutting is of considerable importance.

The first cut made in the tree is the vertical channel, the object of which is to allow the latex to run readily from the ends of the various more or less horizontal cuts to the receptacle. This, therefore, should be plumb, and may be marked off by means of any rough plumb-line. Plate XVII. is an illustration of the method of opening up. The cut may, however, be made from below upward or from the top downward, as may be most convenient. The actual angle at which the side cuts are made does not particularly matter, provided they are steep enough to allow the somewhat thick latex to flow readily.

If too steep or nearly approaching the vertical, but little area comparatively is tapped, as the latex cells run vertically; and if too flat or nearly horizontal, the latex, instead of flowing along the cut and down the channel made for it, is apt to run over the trunk of the tree at any point and be lost, or at least be most difficult to collect, and then only as second-rate or scrap rubber. The length of the branching cuts depends upon the area of tapping surface available, or, in other words, the size of the tree.

On an old and large tree 1 foot in length for such cuts will be found as long as can be conveniently made. On small trees it is a good rule never to include more than half the circumference. Thus, on a tree of, say, five years of age, 6 inches in diameter, the side cuts should be 4 inches to 5 inches in length only, if on both sides of the vertical channel, or twice this if only on one side (half herring-bone). Generally, too, it will be found that, unless the trees are exceptionally even in growth, the cuts nearer the ground will be longer than those higher up the trunk. With large trees it is better to have a number of “herring-bone” or “V” systems than to have unwieldy side cuts, and, with the spiral system, to make half or multiple spirals of them.

To ensure these side cuts, which should be alternate rather than opposite, being parallel, a good method is to have a piece of thin tin or zinc cut to the desired shape—viz., a four-sided figure, with the parallel sides at an angle of

about 45 degrees with the top and bottom, thus



This, when one of the

sides is held straight with the vertical cut, can be used as a gauge, and the wings marked off with a piece of chalk or charcoal. Once thus carefully marked off, subsequent cutting will be found easier and more regular tapping area will be conserved, and the cuts, when they ultimately meet, will be found to do so nearly equally and without waste.

The vertical channel, being only a channel to conduct the latex to the receptacle and to prevent it spreading over the tree, need only be a light one, and one-quarter of an inch or so deep will be found enough. This channel is not ordinarily touched or cut again after being once opened unless the growth

of renewed bark renders it necessary, and then it is only lightly reopened to about its original width or depth.

The transverse cuts, on the other hand, to get the maximum flow of latex, must be as deep as possible short of cutting into the cambium. This matter of the depth to which the bark may be cut into with safety is perhaps the most important in the whole process of tapping. The work of ringbarking the trees affords an apposite illustration.

There we wish to *kill* the trees, and therefore it is essential that all the bark be removed, and even the sapwood cut into, for we know that if not deeply done the bark will grow again, and the tree recover instead of die off. In *this* case the opposite is desired, for we not only want the trees to *live*, but the bark to grow again as quickly as possible, that we may tap it again, and so care must be taken that the cambium or delicate viscous cuticle between the actual bark or cortex and the sapwood, from which the cells of the bark are formed, is not cut through and removed. It will require a little practice to avoid doing this, but this is soon attained. When the cambium has been so damaged, the wound is often, indeed generally, covered by bark again ultimately, but close investigation will show that the growth of bark in that case has been *over* it and from around the wound and not *on* it, and the result is always a lumpy or uneven surface, making subsequent tapping operations most difficult.

In width both vertical channel and first or opening slanting cuts shov'd be $\frac{3}{8}$ to $\frac{1}{2}$ an inch, which will be found quite sufficient for subsequent working.

The opening up of trees will be found to take a little time, and the number that can be done in a day not great, at any rate, at first; but, for reasons explained above, it is better to do it carefully and well than risk damage to a tree than can never be again undone. Subsequent tapping consists of paring off the least possible thickness of bark sufficient to open up the cells and start the latex flowing again. The bark will be found granular rather than fibrous in texture, so that with a sharp tool the necessary thin shavings may be pared off quickly and neatly with but little practice. In any work sharp tools give better results than blunt, and it would seem scarcely necessary, perhaps, to add that the rubber tapping knife should be kept sharp. In tapping rubber a blunt knife is an expensive form of laziness, and it wastes bark surface by tearing instead of clearly cutting; it renders the scrap difficult to take off, and, owing to extra power required, is far more apt to slip and to make ugly wounds in the cambium, when it does slip, than is a sharp knife.

Immediately a tree is opened or tapped, at the bottom of the vertical channel a small tin spout is fixed. This consists of any small piece of tin, galvanised iron, or zinc, about 2 to $2\frac{1}{2}$ inches long by 1 to $1\frac{1}{2}$ inch wide, slightly bent longitudinally, which is pressed into the bark with, if necessary, a light tap of the handle of the knife, and its object is to conduct the latex from the duct to the cup. These spouts are not affixed daily, but are left in the tree while the tapping operations continue. In Plate XV. these spouts will be noticed just above the collecting cups.

The collecting cups, used for catching the latex as it slowly flows or drips for the spouts, are of various sizes, generally $2\frac{1}{2}$ to 3 inches wide at the top and sometimes sloping or rounded at the bottom, but not to such an extent that they will not readily stand on level surfaces. These are of block tin or enamelled iron, and are seamless—that is, blocked from one piece—so that no corners exist in which latex might coagulate or make the tins be difficult to clean. As a matter of fact, almost any small receptacle could be used, but, as the presence of any dirt, rust, &c., would be detrimental to the colour and quality of the rubber, enamel tins that can be kept quite clean are best. In short, cleanliness is as important in rubber-tapping as in dairying.

Very similar tins are often used attached to the tree at the top end of the vertical channel, from which water is allowed to drip for the purpose of assisting the flow of the latex into the receptacles and preventing coagulation on the tree. These are called “drip-tins,” and are usually of two kinds: the

first, a species of zinc funnel with a small brass screw, by means of which the drip can be regulated; and the second, a commoner one, of galvanised blocked tin, shaped like a collecting-cup, but with a small hole in the bottom and near one edge, through which a small piece of loose cotton-wick is inserted.

These drip-tins are affixed by means of tacks or small pegs to the tree and left there, and a given quantity of water, either pure or mixed with formalin, ammonia, or any other chemical that may be required, is put into them at the time of tapping.

The use of drip-tins is deprecated by some planters on a large scale as being too troublesome, unnecessary, or for various other reasons. It has been stated that water coming in contact with the newly cut or opened latex-ducts tends to shrink them and stop the flow. This may be so, though I have not observed it to any appreciable extent. In any case this would only apply to the spiral or similar system of tapping, for drip-tins cannot be conveniently used with other methods, except the "herring-bone," and with this I have found them very successful and satisfactory.

With this latter method the water flows only down the vertical channel, and not over the newly cut surfaces.

Water mixes readily with Pará latex, the ordinary thick and viscous secretion being held apparently in complete solution in water, and becoming a thin milky liquid, which is easily strained and manipulated. When in quantity water retards the coagulation somewhat, but is not in any way detrimental to the rubber, and just exactly the same proportion of coagulated rubber will be ultimately obtained as latex existed in the mixture, however much water may have been added.

The best time of day to tap is early in the morning or late in the afternoon, as the flow of latex has been found to decrease somewhat in the heat of the day, and also has then a tendency to coagulate too rapidly and on the faces of the cuts, which adds to the proportion of scrap rubber, is more difficult to collect as well as less valuable, and hinders the natural flow.

Tapping ordinarily in this country should not be continued after about 10 or 11 a.m. or started again before 5 p.m., but in cloudy weather or in well laid out plantations, where the situation is naturally a protected one and the trees shade each others' stems, the time might be lengthened. It is a good plan to start tapping early with the outside or exposed trees first, continuing till 11 a.m., and then collecting the latex, taking it into the shed and coagulating it at once, subsequently collecting the scrap in the afternoon. "Scrap" is the term given to the latex that has coagulated naturally on the cut surfaces of the tree. Nearly always there is some latex that does not flow off, and which, having hardened on the cut, must be removed before the tapping can be continued. It has to be pulled off by hand, and comes away in strings, which are usually rolled into balls. This should be collected, if possible, the same day the tapping is done, and within twelve hours, as after that it is more difficult to deal with. Scrap is consequently to be avoided as much as possible on account of the extra cost of its collection and its somewhat lesser value, due to the unavoidable presence of small particles of bark, &c.

There is no especially recognised season for tapping, which, under favourable conditions, may be continued all the year round. In very heavy monsoonal weather, however, it becomes difficult, if not impossible, owing to the rain-water running down the tree trunk and either mingling with and washing the latex (and a considerable amount of dirt) over the bark indiscriminately or swamping the collecting tins; also, if a good crop of fertile seed is desired, it has been found inadvisable to continue tapping through the blossoming period. During dry periods of the day in the rainy season tapping can be satisfactorily carried out, and the flow of latex will be found rather more free; but, as it is not so thick as in drier weather, it is an open question whether much more is obtained. In very dry weather the flow, on the other hand, will be found to be materially less, though thicker in consistency.

Tapping should be done regularly and as nearly as possible at similar intervals of time to obtain the best results. The frequency with which any one cut may with safety and advantage be reopened depends upon a curious natural action in the growth of bark or new covering of the severed latex cells, by which an extra supply of latex is supplied to the newly healing parts. This is known as "wound response," and is evidenced by a slight swelling or convex form of the newly growing bark. Wound response does not, however, take place at once, and in newly opened trees is often not evident until after several successive tappings. Even in trees that have been regularly tapped, very little response is to be seen for the first twelve hours after tapping, but within twenty-four hours it becomes very evident. Every other day, therefore, is the most frequent period at which tapping may be best done.

In opening trees for the first time the amount of latex obtained is often little, and may seem most disappointing, but as the operations continue the flow will be found for the above reason to materially increase. Sometimes but little wound response is noticeable for the first week or more, and the operator is inclined to cut away more bark or to cut deeper; this inclination must be combated, however, and patience exercised, for nothing is to be gained by the removal of more bark, and the wound response is not in the least hastened thereby.

When this swelling to almost bursting point of the latex cells, which is watched for and welcomed by the grower, takes place, it can be understood that but the thinnest of shavings or parings is necessary to open the cells and obtain a steady flow of the valuable "milk."

After tapping, the flow of latex seldom continues for more than about two hours, and often ceases within a few minutes; then the contents of the cups are collected and taken to the store or house for subsequent treatment.

The amount of bark removed in a season or a year varies very much with the nature of the tree. If the transverse cuts are apart, and alternate as suggested, and the tapping is carefully done, the lower cut will not be reached for a twelve month or so with regular cutting three times a week (every other day). Renewed bark should not be tapped for eighteen months or so, and, if possible, left for two years. The growth can be tested from time to time by the point of a penknife.

Plate XV. shows the renewed bark of the previous season's work just above the present cuts. While one-half or side of the tree is renewing its bark, the other side may be tapped. How long this may be continued has not yet been determined, as no trees of any great age that have been submitted to regular tapping exist; but, so far as can be seen, with due care, there is no need for a tree to suffer in its vitality from the tapping operation, and every reason to show that it will not only continue to produce, but to bear more and more as it increases in growth, for a very long time—a lifetime, at least.

Subsequent tapping operations on renewed bark are similar to those described, except that the markings are generally clear enough to enable the operator to dispense with the marking out and measuring necessary in opening up for the first time.

The next article will deal with the treatment of the latex on being brought in from the field.

POLING OF FOURCROYA SUCKERS.

The Fourcroya plant in our illustration was brought to this office last week as a curiosity. But the poling of young suckers is a common occurrence when they are attached to the mother plant which has poled. This shows that care should be exercised, when taking up suckers for immediate planting, not to take them from a poling plant. In any case it is better to place all suckers in a nursery for a year, during which time they will attain the proper size for planting out, and any which come from the source mentioned will in that time have developed the short, slim pole here shown.

Plate XVIII.



POLING OF FOURCROYA SUCKERS.

Chemistry.

PLANTS POISONOUS TO STOCK.

By J. C. BRÜNNICH, F.I.C., Chemist to the Department of Agriculture and Stock.

THE WALLFLOWER POISON-BUSH.

In our State, where stock-raising and dairying are our most important industries, a knowledge of all plants which may have deleterious properties when used as fodder is an absolute necessity. Unfortunately, very little thorough scientific work has been done in this respect, and many fodder plants which are classed as good fodders by some are reputed to be poisonous to stock by others. An exhaustive investigation with regard to the composition of the very large number of plants which are reputed to be poisonous should form an important part of the duties of the Department of Agriculture and Stock, and would necessitate the combined efforts of the botanist, chemist, and veterinary surgeon.

The chemical work involved in these researches is generally a very laborious one, frequently giving, even after months of patient work, only negative results, and only occasionally the investigator is fortunate enough to isolate the chemical compounds which are the cause of the poisonous effects. In many cases the poison is of such volatile nature or so easily decomposed that it disappears on drying, and the plant, when reaching the laboratory, has lost all its poisonous properties; in a good many instances the plants contain the poison only at a certain stage of their growth; in other cases, again, the compound in a plant may in itself be harmless, but, on being consumed by the animal as fodder, a decomposition takes place during digestion which produces poisonous compounds. As an instance of the latter classes must be mentioned the ill-effects of sorghum and all allied fodder plants, the poisonous properties of which were for a long time shrouded in mystery, and were subject to many speculations and theories, until Messrs. Dunstan and Henry conclusively proved the presence of a glucoside in the young plants which, on decomposition, yields hydrocyanic or prussic acid.

One of our most notorious poisonous plants in the northern parts of our State, which is also found pretty well over the whole of Northern Australia, is a shrub belonging to the order Leguminosæ, the WALLFLOWER POISON-BUSH. This plant is described in "Plants reputed Poisonous and Injurious to Stock," by F. M. Bailey, F.L.S., Colonial Botanist, and P. R. Gordon, Chief Inspector of Stock, as follows:—

Gastrolobium grandiflorum, the Wallflower Poison-bush. This is also known as Australian Poison-bush and the Desert Poison-bush.

It is a dwarf or at times tall shrub, of a somewhat light-grey colour, being more or less clothed with short soft hairs. Leaves usually opposite, of a harsh dry nature, oblong, and always more or less notched at the top, 1 to 3 inches long. Flowers in the axils of the leaves near the end of the branchlets, in short often dense panicles, chocolate-coloured, or resembling the flowers of the garden wallflower; flower nearly 1 inch in diameter. Pods softly hairy, about 1 inch long. This dangerous shrub is met with in North Queensland (inland) and North Australia. Others of the genus constitute the most dangerous poison-bushes of Western Australia.

There is no doubt as to the poisonous nature of this bush. So virulent is its poison at certain stages of its growth that working horses and teams of bullocks have to be yarded at night when passing through belts of the plant. Very heavy losses have occurred from it on the road from Cleveland Bay to Hughenden. Drivers and teamsters state that it ceases to be poisonous after the flower appears. On analysis, Mr. Staiger failed to discover any active

poison, but the analysis was made from dried specimens, and he is of opinion that if freshly-cut specimens were analysed an active poison might be discovered.

Species of the following allied genera:—*Isotropis*, *Gompholobium*, and *Oxolobium*—in other parts of Australia, are considered as more or less dangerous poison plant.

Samples of plants of these genera have been examined repeatedly by a great number of scientists, without getting positive proofs of the presence of poison compounds, and only after a very long investigation, carried out at the Government Laboratory of Western Australia, poisonous alkaloids were isolated from the York Road Poison Plant (*Gastrolobium calycinum*) and Box Poison Plant (*Oxyllobium parviflorum*), as published in "Examination of the Western Australian Poison Plants," by E. A. Mann, Government Analyst and Chemist to the Department of Agriculture of Western Australia.

The methods employed by Mann and Dr. Ince were used at our laboratory for the extraction of a large quantity of *Gastrolobium grandiflorum*, which was collected at Torrens Creek by Stock Inspector Collins, of Hughenden. Two large bags of the plants were received, but every one of the branches had fully developed seed pods, with only a few flowers here and there; and this fact must account for the failure to isolate the poisonous alkaloid. Three different lots, of about 3 lb. each, of the powdered plant were extracted with acidulated water (containing 1 per cent. of H_2SO_4), the extract cleared with lead acetate, the filtrate treated with H_2S to remove excess of lead, H_2S driven off by a current of air, and the alkaloid precipitated with tannic acid. In the precipitate the alkaloid was set free by treating with freshly-prepared lead hydroxide, the alkaloid dissolved out with alcohol, and, after evaporation at ordinary temperature, allowed to crystallise as hydrochloride. Only in one of the extracts a very slight amount of crystallised residue was obtained, which gave alkaloidal reactions, and evidently the plants were too old; and the opinion expressed by stock-owners, that the shrub is not dangerous after flowering, appears, therefore, to be quite correct.

A further supply of the plant was obtained by favour of Dr. Thos. L. Bancroft, who for years has made a special study of the pharmacology of our native flora. These plants, collected at Stannary Hills, North Queensland, were considerably younger, showed no seed pods, but were well in flower. On extraction of the plants a few grains of a residue were obtained, which gave distinct alkaloidal reactions and crystallised in needles similarly to those described by Mann for Cygnine hydrochloride. This residue had a peculiar odour, resembling nicotine. The quantity of the alkaloidal residue was too small to be purified by recrystallisation, and the crude alkaloid itself was handed to the Principal Veterinary Surgeon and Bacteriologist of our Department, Mr. Sydney Dodd, F.R.C.V.S., for physiological experiments on guinea-pigs; and I herewith give his report in full:—

EXPERIMENTS WITH ALKALOIDAL EXTRACT OF "GASTROLOBIUM" ON GUINEA PIGS.

First Experiment.

15th June, 1908. Guinea pig No. 1. Boar. Live weight, 1 lb. 14 oz. 8½ drams. Injected 9 a.m., subcutaneously, with one-tenth grain gastrolobium residue in 1 c.c. of water.

3 minutes later—	Breathing slightly hurried.
4 " "	Breathing rapid, slight salivation, slight spasms like strychnine poisoning.
5 " "	Marked spasms of body, legs apparently unaffected. Spasms succeed each other very rapidly. Head is stretched out.
6 " "	Animal tries to move, appears to retain use of limbs, spasms continue.
7-8 " "	Same. Still able to walk a little, retains sight.
9 " "	Spasms not so marked.
10 " "	Animal appears exhausted.
12 " "	Quieter, very few spasms. When animal attempts to move spasms recur very markedly.
16 " "	Animal able to walk about, but easily becomes exhausted.
18 " "	Very quiet, no spasms, breathing shallow.
20 " "	One or two convulsions, then lies stretched out full length, but afterwards reassumes natural posture.

34 minutes later—An occasional spasm.
 42 " " On being moved slight spasms appear, then lies very still.
 55 " " Improving, breathing better, no spasms.
 82 " " Much brighter.
 3½ hours later—Quite recovered, but weak.
 Animal showed no ill effects next day.

Second Experiment.

Guinea pig No. 2. Sow, pregnant. Live weight, 2 lb. 1 oz. ½-dram. Administered per orem one-fifth grain in 2 c.c. s. water, by means of a pipette.

Animal vomited slightly during administration, but only a few drops of the liquid were spilled.

3 minutes later—Breathing deep, and rather hurried.

5 " " Very slight spasms.

30 " " Animal appears quite well, only thing noticeable is profuse and frequent urination.

No subsequent ill effects of any kind were observed.

Third Experiment.

Guinea pig No. 3. Sow, pregnant. Live weight, 1 lb. 15 oz. Injected subcutaneously with one-fifth grain of gastrolobium residue in 2 c.c. s. water.

3 minutes later—Breathing rapid and shallow, spasms commencing, chiefly in fore part of trunk.

7 " " Very slight spasms.

9 " " Spasms increasing in severity and rapidity

10 " " Spasms very violent, affects whole of body.

12 " " Spasms very violent and continuous, affects whole of body; animal lies stretched out full length.

13 " " Spasms intermittent, but on animal being moved they become more violent and continuous.

16 " " Animal exhausted, spasms slighter.

18 " " Animal moving about a little, but movement causes recurrence of spasms, pupils very dilated.

21 " " Animal still moving about, spasms slight, but easily gets exhausted.

30 " " Animal very quiet, spasms slight, and not so frequent.

40 " " Ditto ditto.

60 " " Slight spasms, eyes seem very sensitive to light, keeps them almost closed.

2½ hours later—Animal sits with its head in a corner, refuses to move. If moved forcibly, violent spasms set in.

3 to 7 " " Spasms still continue intermittently. Animal quite prostrate; appears on point of death. Breathing hardly discerned.

Next day animal apparently quite recovered. No symptoms of any kind.

Fourth Experiment.

30th June, 1908. Guinea pig No. 4. Sow. Live weight, 1 lb. 13½ oz. Injected subcutaneously with ½-grain gastrolobium residue in 1 c.c. of water.

½-minute later—Breathing becoming rapid.

1 " " Breathing very rapid, chest heaving, animal uneasy.

2 " " Violent convulsions setting in very suddenly.

2½ " " Animal bounding into the air, then rolling over and over. Marked opisthotonos; body bent back like a bow.

3 " " Still violent convulsions, animal not still from the commencement of the seizure.

3½ " " Animal almost comatose, only one or two spasms.

4 " " Animal just breathing.

4½ " " Animal dead after giving a few short gasps for breath.

Post-mortem examination held immediately.

No reaction at seat of injection.

Mesenteric vessels injected.

Lungs markedly congested.

Liver slightly congested.

Heart greatly distended; responds readily to stimuli; auricles still contract half an hour after death.

It is particularly interesting to note that the results of these experiments agree very closely with the experiments made by Dr. Blackburne, in Western Australia, with the pure alkaloid extracted from *Gastrolobium calycinum*.

A characteristic of this alkaloid is the ease with which it is decomposed, and for this reason Mr. Mann advocates as an antidote the use of a solution of potassium permanganate (Condy's fluid), which has been used with great success in America for the treatment of stock poisoned by eating certain indigenous plants. A few practical experiments, which already have been carried out in Western Australia by stock-owners, seem to indicate a like success of the use of permanganate as an antidote against gastrolobium poisoning, and a great number of valuable stud sheep have been saved by its use.

ANALYSES OF FERTILISERS (SUPPLEMENTARY LIST).
TAKEN AND ANALYSED UNDER "THE FERTILISERS ACT OF 1905."

Fertiliser.	Where Obtained.	Moisture.	PHOSPHORIC ACID P_2O_5 .			Potash, K_2O .	Nitrogen, N.	MECHANICAL CONDITION.			Remarks.
			Water Soluble.	Citrate Soluble.	Total.			Coarse.	Medium.	Fine.	
Fertiliser ...	Birt and Co., Murarrie	7.34	..	..	21.08	..	3.20				
Dried blood ...	ditto	10.98	..	..	..	..	13.14				
Ammonium sulphate (B.S.A.)	Brisbane Gas Company	.20	..	..	..	..	20.50				
Dried blood ...	Bergl Australia, Bowen	10.03	..	..	1.80	..	14.00				
Pineapple Manure ...	Webster and Co., Brisbane	7.26	11.60	..	12.62	8.24	3.00	..	..	..	N as NH_3

J. C. BRÜNNICH,
Chemist to the Department of Agriculture and Stock.

Animal Pathology.

STOMACH OR WIRE WORMS IN SHEEP.

By SYDNEY DODD, F.R.C.V.S.,
Principal Veterinary Surgeon and Bacteriologist.

Stomach worms in sheep and calves are known to exist pretty generally throughout the world, and are often a source of great loss to stock-raisers. In some parts of Queensland this condition is one of the most serious drawbacks to sheep-raising, the mortality amongst lambs being very high. In calves, also in some districts, parasitic gastritis or stomach worm is very prevalent, more especially on the coastal districts or where the climate is moist. In the latter animal it gives rise to a condition known amongst stock-owners as "bottle."

Stomach worms are to be found in ruminating animals of all ages, but in adult sheep and cattle their presence, unless in very large numbers, does not usually give rise to any outward symptoms, although they are a source of infection to young stock. It is in lambs and young calves that their effects are most serious.

Symptoms.

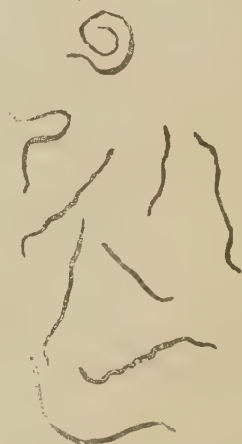
The most constant symptom is scouring, and this is seldom or never absent. Accompanying the diarrhoea is rapid loss of flesh and loss of appetite. An unusual thirst is often seen, and lambs at times show a tendency to lick sand or earth; but the evidence of this latter is often only seen when the fourth stomach is opened after death. The temperature may be above normal. There is no cough as a rule.

In the more chronic cases, the disease is accompanied by dropsical swellings of the dependent parts, chiefly seen under the lower jaw. The swelling in the latter place in calves is said by stock-owners to have some resemblance to a bottle, hence its popular name in Queensland—"bottle." There is also great anæmia, seen in the marked paleness of the visible mucous membranes, such as of the eye and mouth.

In some cases the course of illness is very acute in very young animals—these sometimes dying in a very few days, but, as a rule, the course is a chronic one, the animals being more or less ill with the above symptoms.

A positive diagnosis of this disease may be made by killing one of the badly affected animals and opening the fourth stomach, then emptying its contents into a shallow glass dish or basin. If the worms are present in great numbers, as they usually are, by carefully searching the liquid one can see them wriggling about very vigorously, like eels. They are from $\frac{1}{2}$ to $1\frac{1}{2}$ inch long, and about as thick as a pin. Or, in order to observe them better, one should empty out the stomach contents and scrape the lining of the stomach with a knife, then mixing the scraping with a little clean water in a small flat-bottomed glass dish.

The worm which is most prevalent in these conditions is known as *Strongylus contortus* (or *Hæmonchus contortus*), receiving its name "contortus" owing to its having a red-and-white twisted appearance like a barber's pole, due to the arrangement of the ovarian tubes around the intestines. The body of the worm is usually brown or reddish.



Strongylus contortus
(Stomach Worm,
natural size).

LIFE HISTORY OF THE TWISTED STOMACH WORM.

The *Strongylus contortus* is ovo-viviparous—that is, the eggs contain living embryos before the former are discharged from the adult worm.

The life history of this worm has recently been worked out by Mr. Ransom, Zoologist to the United States Department of Agriculture, and is as follows:—

In the stomach of affected animals, the worms, after being fertilised by the male, produce large numbers of eggs, which are very minute. These are passed out with the droppings, and are scattered widely over the paddocks.

If the temperature is above 40 degrees to 50 degrees Fahr., the eggs hatch out in from two hours to a few weeks, depending upon whether the temperature is high or low. If the temperature is below 40 degrees Fahr., the eggs remain dormant, and can remain in this condition for two or three months, and afterwards hatch out if the weather becomes warmer. Freezing or drying soon kills unhatched eggs. The minute worm which hatches from the eggs feeds upon the organic material in the manure, and grows until it is nearly one-thirtieth of an inch in length. Further development then ceases until it is swallowed by a sheep or other ruminant, after which it again begins to grow, and reaches maturity in the fourth stomach of its host in two or three weeks. The chances of the worms being swallowed are greatly increased by the fact that they crawl up blades of grass whenever sufficient moisture, such as a rain, fog, or dew, is present.

The young worms which have reached the stage when they are ready to be taken into the body of the host are greatly resistant to cold and dryness. They will survive repeated freezing, and have been kept in a dried condition for thirty-five days, afterwards reviving when moisture was added. At a temperature of about 70 degrees Fahr. young worms have been kept alive for six months, but experiments have shown that land over which no cattle, sheep, or goats have been allowed to graze for a year will be free from infection at the end of that period.

The time required for a clean pasture to become infectious after sheep, cattle, or goats are placed upon it depends upon the temperature—that is, the eggs of the worms contained in the droppings must hatch out, and the young worms develop into their final larval stage, at which stage they are able to continue their development in the body of their host, and the

rapidity of this depends upon the temperature. The final larval stage is reached in three or four days to three to four weeks after the eggs have been dropped from their host, according to the temperature conditions. It has been proved that eggs or newly-hatched larvæ are unable to develop if swallowed by an animal—a certain degree of development must first take place outside the body of its host—and although a certain amount of infection may take place through drinking from pools soiled by droppings, yet the most frequent source is the pasture; and it explains why this disease is much more prevalent on the coastal district or where the rainfall is heavy, thus keeping the grass continually moist.

TREATMENT.

In America very elaborate methods have been devised for freeing the pastures from infection, but generally speaking the conditions obtaining in this country do not admit of their practical application here.

Various remedies have been used for destroying stomach worms. The one used most commonly in South Africa is a solution of bluestone (sulphate of copper), and I have frequently used it with satisfactory results. The bluestone should be in clear blue crystals, with no white patches or crusts. It should not be dissolved in an iron or galvanised vessel—an enamelled bucket answers very well. Rain water is best for making the solution.



Embryo of *Strongylus contortus* coiled on the tip of a blade of grass.—After Ransom. Enlarged 100 times.

The doses recommended are as follow :—

For Lambs: Take 1 lb. (Avoirdupois) of pure bluestone and 1 lb. of Colman's mustard (fresh). Mix well with 12 gallons of rain water.

Dose for Lambs: 3 to 6 months old, give 2 oz.; 6 to 9 months old, 3 oz.; 9 to 12 months old, 3½ to 4 oz.

For Sheep: Take 1 lb. (Avoirdupois) pure bluestone, 1 lb. Colman's mustard (fresh). Mix with 10 gallons of rain water.

Dose for sheep over 12 months old, give 4 oz.

Dose for calves, 15 to 30 grs. of bluestone dissolved in 1 quart of rain water.

The animals should be fasted from twenty to twenty-four hours before dosing, and they should be kept away from water on the day they are dosed. It is important that the bluestone and water be accurately weighed and measured, and a graduated medicine glass should be used to measure out the various doses individually. In dosing sheep it is better to leave them standing on all four legs, as it has been found by experience that if the dose is taken quietly when the animal is in the standing position most of the liquid will pass directly into the fourth stomach, while if the animal is placed on its haunches, only part of the liquid goes immediately into the stomach where it is needed. An assistant places the sheep between his legs, and raises its nose up to a level with its forehead. The person giving the dose then places his hand lightly over the animal's nose and inserts one or two fingers into the left side of the animal's mouth in order to open it. At the same time he inserts the neck of the bottle containing the measured dose, and pours gently as fast as the animal will drink. No attempt should be made to force the animal's mouth wide open or to hold the nose high in the air.

Many sheep are killed by careless or hurried dosing. Great care should be exercised in order to prevent the liquid going down "the wrong way"—that is, into the lungs. Therefore, if an animal coughs or bleats, stop pouring and lower the head at once. Do not be in a hurry to get the job finished or try to break records. If a very large number of animals are to be drenched, it is better to drench a certain proportion daily, and turn those dosed into a separate paddock until the whole are finished.

It is also advisable before dosing the whole of the flock to test the drench by dosing a few of the animals first, and then waiting a day or so to see whether any bad result follows.

In America good results have been obtained from a single dose of a 1 per cent. solution of coal tar creosote. The solution is made by shaking together 1 oz. of coal tar creosote and 99 oz. of water (making 5 pints altogether). The dose of this mixture is as follows :—

Lambs, 4 to 12 months old, 2 to 4 oz.

Sheep, 12 months and over, 3 to 5 oz.

Calves, 3 to 8 months old, 5 to 10 oz.

Yearlings, 1 pint.

Coal tar creosote has been found to vary greatly in composition, and in the United States complaints have been made that the drug dispensed by some chemists as coal tar creosote has failed to give satisfactory results.

Gasoline is one of the popular remedies in America for stomach worms. If gasoline treatment be adopted, it is important to repeat the dose, and it is usual to give it on three successive days. The evening before the first dose is to be given the animals are shut up without feed or water, and are dosed at 10 o'clock the next morning. Three hours later they are fed and watered. At night they are again shut up without feed or water. The next morning the second dose is given, and the third morning the third dose, the treatment before and after dosing being the same in each case.

The doses are :—

Lambs, $\frac{1}{4}$ -oz.

Sheep, $\frac{1}{2}$ -oz.

Calves, $\frac{1}{2}$ -oz.

Yearlings, 1 oz.

The dose for each animal is mixed and given separately in linseed oil or milk. Gasoline should not be given in water.

In addition to whatever treatment is adopted, it is very necessary that the strength of the animals should be maintained by generous feeding.

PREVENTION.

From what has been said in the preceding pages, it will be seen that worms have no power of reproduction outside the body of their host, and therefore the chances of worms infecting an animal are in direct relation to the number of sheep and cattle grazing over the pasture, and also the size of the latter. It will be easily understood that if the area of the grazing land is large and the relative number of sheep and cattle on it small, there is less probability of an animal eating grass that is contaminated with worm embryos than there would be if the conditions were reversed—that is, a small grazing area and a large number of animals on it. In other words, overstocking of land plays a great part in the cause of this disease. Paddocks on which a large number of lambs are grazed are certain to be greatly contaminated, and lambs put to graze on this the following season run great risk of infection. A few worms may probably be found in most sheep, but their eggs cannot develop into mature worms inside the body. They must be passed out with the excrement, and after a certain stage of development find their way into the body of another lamb or calf. From this it is evident that worms may be present for years without any serious loss. It is only when the number of worms swallowed by an animal becomes excessive that the train of symptoms and results ensue.

Therefore, in order to reduce the prospects of infection to a minimum, lambs or calves should not be grazed over ground that has become grossly infested with worms. The larger run they have the better. Also, it should be remembered that moist spots are very favourable places for harbouring the immature worms. If a paddock has become heavily infested, the better way would be to remove sheep and cattle from it for a year, and only use it for grazing horses; or, in some districts that are more closely settled, the land could be cultivated for a year.

Stomach worms are not so prevalent on those runs where the grass has been frequently burned off. This is what one would naturally expect, knowing the life history of the worm; but, unfortunately, this means of keeping down worms is not practicable in many instances, because it is the small selector who often suffers the most heavily, and he cannot, as a rule, afford to burn off his grass; and also worms are most prevalent in moist places, and here the grass is usually too green to burn.

General Notes.

GROWING PUMPKINS IN DRY WEATHER.

We are in receipt of a letter from a correspondent who advises those who fail to grow pumpkins in a very dry time to sow the seed on a heap of rotten straw. His children planted a seed in such a situation. All through the hot, dry weather it grew and flourished, the straw keeping up a supply of moisture. Lately, the crop was gathered, and resulted in a yield of 125 good ripe pumpkins, weighing 1,221 lb., and 30 or 40 green ones, the whole produced on one single vine. Our correspondent, after this experience, intends, in future, to leave a vacant strip of land at intervals in his wheat field, rake the straw into it, and plant pumpkins, as he is convinced that in the driest season good crops of pumpkins may be got by this method.

THE BANANA APPLE.

A new variety of apple, called the "Banana Apple," is spoken very highly of in America, and is said to have realised very high prices. It is claimed to be one of the best of all apples in quality. It is also a beautiful apple, looking like lumps of gold tinged with red on one side. The fruit is large and uniformly fair and free from worm. The tree is a good bearer and fast grower. It is a long-keeping winter apple. Last fall the banana apple fruited in the Hood River, Oregon district, and sold there at 12 dollars per box, which is the highest price ever known for apples in America.

A SWEET-SCENTED DAHLIA.

A sweet-scented dahlia has been introduced by Herr T. C. Schmidt, of Erfurt. The plant originated from Mexico, is of good habit, and the flowers are honey-scented. The blooms are of a shade of orange-scarlet, and borne on long stems, thus rendering them very suitable for use as cut flowers. The plant attains a height of 4 or 5 feet.

MEBOS: A NEW TABLE DELICACY.

Some time ago, Sir Harry Rawson, Governor of New South Wales, called the attention of the Department of Agriculture to a table delicacy made in Cape Colony, called "Mebos," which he thought worth while experimenting with in Australia, and we learn from the "Indian Trade Journal" that Miss Rawson obtained from the Cape a recipe for the process. It is a very simple one:—

Take soft ripe apricots, lay them in salt water (about 2 oz. of salt to a quart bottle) for a few hours. Then lay them on a mat to dry in the sun; the next day press them between the hands to flatten and to let the stone come out. The next day repeat the process. At the Cape it generally dries and becomes "Mebos" in three or four days in the sun, but, if the weather should be damp, they might be dried in heated rooms or a cool oven. To crystallise the "Mebos," lay them in limewater for five minutes till they feel nice and tender; take out, wipe dry on a soft cloth, and rub coarse crystallised white sugar well into each; take $1\frac{1}{2}$ lb. of sugar to 1 lb. of "Mebos." Pack closely, with lots of sugar in between, in jars that will cork well. This is said to make a very nice sweetmeat, and is reported to be a remedy for sea-sickness. The limewater is made by adding two tablespoonfuls of fine lime to a quart of boiling water. This should be mixed well, and, when the lime has drained to the bottom, the clear water may be poured into a bottle, corked, and kept for use.

SEEDLESS TOMATO.

One of the agents of the American Department of Agriculture, working on his New Jersey farm, is said to have produced a new vegetable novelty, in the shape of a seedless tomato. The variety has been called the "Giant," because of the large size that the plant attains. Six years of experimentation was necessary to produce the seedless tomato. Each ordinary tomato contains hundreds of seeds, while the form now developed seldom contains more than 50 seeds, and often none. Before attaining success in his experiments, the Government scientist produced large crops of freak tomatoes. Some plants included clusters no larger than peas. In one instance the fruit had the flavour of a strawberry.

RED PICKLED CABBAGE.

Cut the cabbage into slices on a chopping board. Set it upon a dish in layers, with a sprinkling of salt over each layer. Let it stand for one night, then put it into a stone jar. To every 4 quarts of vinegar add 1 oz. of sugar and 2 oz. of mixed spice; heat this mixture almost to boiling point, and when cold pour over the cabbage, which must be well covered by the liquor.

It is fit to be eaten in seven days, although it improves with keeping, and should be of a lovely colour.

MONEY IN WASTE PRODUCTS.

Many thousands of pounds have been lost annually owing to ignorance of the value of residual waste from the products of the soil, both mineral and vegetable, especially the latter. Old colonists will remember that when cotton was largely grown in East and West Moreton thousands of tons of cotton seed were left to rot in heaps near the gin houses or, in rare cases, used as manure. Vast quantities of molasses were run into the rivers as valueless. Sugar-cane bagasse was left to rot or burnt in heaps on the field. When maize was shelled, the cobs were burnt off. And many other so-called waste substances were destroyed, which to-day are worth as much as if not more than the primary product. Amongst this wasted matter may be enumerated orange and lemon skins. Who in Queensland ever thinks of saving the skins of these fruits? In Spain they are dried and sold for shipment to the Baltic. The skins are quite dry and hard when packed, and the lemon skins sell for from 7 to 11 reals (1s. 4d. to 2s. 1½d. about) per arroba (12½ lb.), the Seville skins bringing 10 to 14 reals (1s. 11d. to 2s. 9½d. about) per arroba.

A NEW MARIGOLD.

A newly-introduced plant named *Caltha polysepala*, and now selling in England at one guinea per plant, has a curious history attached to it, which (says Mr. J. R. Jackson, in the "Garden") may or may not be legendary. Report says that an Italian peasant found this plant in some unknown corner of the country, and, in consideration of its marvellous size and great beauty, brought it to Rome and laid it at the feet of Pope Leo. The old Pope benignly accepted the offer, and *C. polysepala* established itself in one of the fountains in the Vatican garden. But the Pope would never let anyone possess bud, or seed, or baby of it, and there, year after year, it wasted its sweetness on the desert air, being seen by nobody, except an aged gentleman, who, presumably, had other things to think about. This policy survived Pope Leo, and continued until the English gardener (he is a male Antigone, daring a formal sin to secure the higher holiness) resolved that such a scandal should no longer endure. So he took with him into the Vatican gardens a covey of his sisters, and his cousins, and his aunts, and, while they engaged the custodian in a conversation on Renaissance art, our hero hooked out a root or two with his umbrella. And now Pope Pius is none the poorer, and the whole world is the richer. This plant is described as the ordinary marsh marigold, multiplied by three—in all its parts, leaf, flower, and stem—a tropical-looking aquatic of unequalled glory.

Plate XIX.



POULTRY FOR EXPORT DRESSED IN THE DEVONSHIRE FASHION.

POULTRY FOR EXPORT.

The Department of Agriculture and Stock has received a letter from Messrs. Chas. E. Brooke and Sons, poultry, game, and meat factors, of Leadenhall Market, London, inquiring whether they can obtain poultry in Queensland. The firm state that they have a very large demand, and can purchase an unlimited quantity of chickens, ducks, and turkeys. The accompanying illustration forwarded by Messrs. Brooke and Sons shows two fowls dressed in the Devonshire fashion, which were awarded a first prize and a cup.

Last June, we are informed, turkey hens were sold at 7s. 6d. per pair in the Brisbane markets, and gobblers at from 10s. to 12s. 6d. per pair. The price of hen turkeys in the Smithfield Market, London, on 2nd December last, was 5s. each and gobblers 8½d. per lb., or about 12s. for a good six or eight months' old bird. Turkeys thrive so well in Queensland that it should not be difficult to establish a regular export trade with this class of fowl.

TOBACCO GROWN IN SAND.

Mr. M. J. Frayne recently showed to the Department of Australia, West Australia, a fine sample of Virginian tobacco which he grew in his small garden in Bramall street, East Perth. The stalk was 3 feet in height, and bore 25 large well-developed leaves. Mr. Frayne planted the seed in October, in pure sand, without any fertiliser, and the stalk referred to was cut four months later.

Times of Sunrise and Sunset at Brisbane, 1908.

DATE.	MAY.		JUNE.		JULY.		AUGUST.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.14	5.16	6.30	5.0	6.39	5.4	6.30	5.18	1 May ● New Moon 1 33 a.m.
2	6.14	5.15	6.31	5.0	6.39	5.4	6.29	5.19	8 „ ☾ First Quarter 9 23 p.m.
3	6.15	5.15	6.31	5.0	6.39	5.4	6.29	5.19	16 „ ○ Full Moon 2 32 „
4	6.15	5.14	6.32	5.0	6.39	5.5	6.28	5.20	23 „ ☾ Last Quarter 10 17 a.m.
5	6.16	5.13	6.32	5.0	6.39	5.5	6.28	5.20	30 „ ● New Moon 1 14 p.m.
6	6.16	5.12	6.33	5.0	6.39	5.5	6.27	5.21	
7	6.17	5.12	6.33	4.59	6.39	5.6	6.26	5.21	7 June ☾ First Quarter 2 56 p.m.
8	6.17	5.11	6.33	4.59	6.39	5.6	6.25	5.22	14 „ ○ Full Moon 11 55 „
9	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.22	21 „ ☾ Last Quarter 3 26 „
10	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.23	29 „ ● New Moon 2 31 a.m.
11	6.19	5.9	6.35	4.59	6.39	5.7	6.23	5.23	
12	6.19	5.8	6.35	4.59	6.38	5.8	6.22	5.24	7 July ☾ First Quarter 6 25 a.m.
13	6.20	5.8	6.36	4.59	6.38	5.8	6.21	5.24	14 „ ○ Full Moon 7 48 „
14	6.21	5.7	6.36	4.59	6.38	5.9	6.21	5.25	20 „ ☾ Last Quarter 10 2 p.m.
15	6.21	5.7	6.36	4.59	6.38	5.9	6.20	5.25	28 „ ● New Moon 5 17 „
16	6.22	5.6	6.37	5.0	6.37	5.10	6.19	5.26	
17	6.22	5.6	6.37	5.0	6.37	5.10	6.18	5.26	5 Aug. ☾ First Quarter 7 40 p.m.
18	6.23	5.5	6.37	5.0	6.37	5.11	6.17	5.27	12 „ ○ Full Moon 2 59 „
19	6.23	5.5	6.37	5.0	6.37	5.11	6.16	5.27	19 „ ☾ Last Quarter 7 25 a.m.
20	6.24	5.4	6.38	5.0	6.36	5.12	6.15	5.28	27 „ ● New Moon 8 59 „
21	6.25	5.4	6.38	5.1	6.36	5.12	6.14	5.28	
22	6.25	5.3	6.38	5.1	6.35	5.13	6.13	5.29	
23	6.26	5.3	6.38	5.1	6.35	5.13	6.12	5.29	
24	6.26	5.2	6.39	5.1	6.34	5.14	6.11	5.30	
25	6.27	5.2	6.39	5.1	6.34	5.14	6.10	5.30	
26	6.28	5.1	6.39	5.2	6.34	5.15	6.9	5.31	
27	6.28	5.1	6.39	5.2	6.33	5.15	6.8	5.31	
28	6.29	5.1	6.39	5.3	6.32	5.16	6.7	5.31	
29	6.29	5.1	6.39	5.3	6.32	5.17	6.6	5.32	
30	6.30	5.0	6.40	5.3	6.31	5.17	6.5	5.32	
31	6.30	5.0	...	...	6.31	5.18	6.4	5.33	

Answers to Correspondents.

POULTRY HOUSE AND YARD.

A BEGINNER, Mooloolah.—For twelve fowls, the house should be 8 feet square, and the yard 50 feet square.

Statistics.

COMMONWEALTH METEOROLOGY.

RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1907.							1908.					
	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.
<i>North.</i>													
Bowen	2·87	Nil	1·28	0·51	0·06	3·71	6·39	10·14	5·63	9·46	3·73	0·99	4·5
Cairns	4·45	0·12	0·39	1·35	0·68	5·35	28·33	27·02	8·03	20·60	5·99	3·05	5·9
Geraldton	8·54	2·39	4·66	1·36	1·42	6·45	33·82	44·39	13·27	39·00	14·23	18·52	2·64
Herberton	2·71	Nil	0·11	0·12	0·17	3·41	9·57	9·29	5·02	8·92	1·40	0·38	3·1
Hughenden	0·95	1·16	Nil	Nil	1·66	0·66	7·75	0·98	5·18	6·91	0·30	..	0·5
Kamerunga State Nurs.	5·29	0·13	1·15	1·19	0·53	2·76	29·82	...	7·47	25·75	4·60	3·363	0·76
Mackay	5·04	0·27	0·25	0·12	0·12	5·76	9·70	9·28	3·83	17·43	14·82	3·25	1·29
Rockhampton	4·16	0·84	0·47	Nil	0·47	3·72	4·42	3·84	9·64	9·77	2·62	0·85	0·10
Townsville	2·38	Nil	0·07	0·14	0·03	2·82	24·26	12·21	6·69	9·03	0·38	2·22	...
<i>South.</i>													
Biggenden State Farm	5·24	1·51	0·96	0·24	1·99	2·50	5·55	2·37	9·82	9·84	2·97	0·74	0·43
Brisbane	2·91	0·39	0·79	0·10	1·37	4·25	3·21	2·80	8·43	18·19	2·45	2·40	0·17
Bundaberg	4·49	0·87	0·43	Nil	1·70	2·90	2·99	4·77	2·82	7·35	4·13	0·67	0·39
Dalby	2·35	0·87	0·71	0·15	0·69	5·18	1·44	0·17	4·88	7·61	0·11	0·37	0·63
Esk	2·66	0·54	0·81	0·57	0·50	3·76	3·72	2·61	10·06	17·04	2·83	1·07	...
Gatton Agric. College	1·85	0·54	0·56	0·15	0·71	3·01	4·55	...	3·38	10·74	...	0·10	0·16
Gindie State Farm ...	2·29	1·58	0·10	0·16	0·61	1·57	4·42	0·20	7·17	6·25	0·02	0·112	...
Gympie	3·77	0·80	0·17	0·47	1·20	3·05	5·49	6·26	11·77	80·8	1·87	2·00	0·38
Ipswich	2·22	0·30	0·43	0·05	0·78	4·45	3·40	1·32	6·63	13·77	2·71	1·14	0·12
Maryborough	6·05	0·64	0·93	0·25	2·74	3·49	5·81	5·62	8·07	11·40	2·52	1·05	0·46
Roma	2·47	1·03	0·42	0·04	1·04	3·70	2·51	0·04	6·38	2·51	0·22	...	0·50
Tewantin	7·61	1·48	0·95	0·55	1·05	3·12	7·36	10·42	12·47	14·39	7·59	8·66	0·75
Warwick	1·27	1·16	1·37	0·01	1·37	3·25	3·13	0·76	4·52	6·65	1·40	0·15	0·80
Westbrook State Farm	2·53	1·04	1·78	Nil	1·08	4·76	3·23	0·43	8·03	1·41	1·40	00·5	...
Yandina	6·98	1·15	0·68	0·80	1·44	2·87	3·05	...	...	16·62	5·45	4·59	...

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered approximate only.

GEORGE G. BOND,
Divisional Officer.

The Markets.

PRICES FOR FRUIT—ROMA-STREET MARKETS.

Article.	JUNE.	
	Prices.	
Apples, per case	7s. 6d. to 12s.	
Apples, New England, per packer	...	
Apricots, Local, per packer	...	
Bananas, Fiji, per case	...	
Bananas, Fiji, per bunch	...	
Citrons, per case	11s. to 11s. 3d.	
Cumquats, quarter-case	...	
Custard Apples, per case	3s. 6d. to 5s.	
Gooseberries, per quarter-case	3s. 6d. to 4s. 9d.	
Lemons (Lisbon), per case	3s. 6d. to 5s.	
Lemons, rough, per case	2s. 6d. to 5s.	
Mandarins, per case	1s. 6d. to 5s.	
Oranges, per case	1s. 6d. to 3s.	
Passion Fruit (Local), per case	...	
Papaw Apples, per quarter-case	1s. to 1s. 6d.	
Peaches, per quarter-case	...	
Pears, per case	...	
Persimmons, per case	...	
Pineapples, smooth, per dozen	1s. to 3s. 6d.	
Pineapples, rough, per dozen	3d. to 1s.	
Rosellas, per sugar bag	...	
Strawberries, per tray	...	
Strawberries, per dozen boxes	...	
Tomatoes, per quarter-case	1s. 6d. to 3s. 6d.	

SOUTHERN FRUIT MARKET.

Apples, local, per bushel case	9s.
Apples, Tasmanian, Eating, per bushel case	10s.
Apples, Tasmanian, Cooking, per bushel case	6s. to 10s.
Bananas, Fiji, per case	13s. 6d. to 14s.
Bananas, Fiji, per bunch	2s. 6d. to 6s. 6d.
Bananas, Queensland, per case	12s. 6d.
Bananas, Queensland, per bunch	1s. 6d. to 4s.
Bananas, Sugar, Queensland, per double case	10s.
Chillies, per bushel	8s. 6d.
Custard Apples, per case	3s. to 5s.
Gooseberries, per quarter-case	3s. 6d. to 4s. 9d.
Loquats, per case	7s.
Mandarins, Emperor, per case	5s. to 6s. 6d.
Mardarins, B.G.R., per case	...
Mandarins, local	9s.
Oranges, Queensland, per case	3s. 6d. to 4s. 6d.
Oranges, Queensland, Navel, per case	10s.
Passion Fruit, per half-case	4s. 6d.
Pears, Victorian, per bushel case	20s.
Pears, Tasmanian, per half-bushel case	6s.
Pineapples, Queens, per dozen	3s. 6d. to 5s.
Pineapples, Queensland (Ripley's), per dozen	4s. to 4s. 6d.
Pineapples, Queensland (smooth), per dozen	...
Pineapples, Queensland, common, choice, per dozen	3s. to 4s.
Pineapples, Queensland, medium, per dozen	2s. 6d.
Strawberries, Queensland, per three-quart tray	3s. 6d. to 4s. 6d.
Tomatoes, per box	...

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR
JULY.

Article.							JULY.
							Prices.
Bacon, Pineapple ...	...	...	...	...	...	lb.	6½d. to 8d.
Bran ...	...	...	...	...	...	ton	£7
Butter, Factory ...	...	...	...	...	...	lb.	1s. 2d.
Chaff, Mixed ...	...	...	...	...	...	ton	£3 to £5 10s.
Chaff, Oaten ...	...	...	...	...	...	,,	£6 10s. to £8
Chaff, Lucerne ...	...	...	...	...	...	,,	£6 to £6 10s.
Chaff, Wheaten ...	...	...	...	...	...	,,	£3 15s. to £4 5s.
Cheese ...	...	...	...	...	...	lb.	8½d. to 9d.
Flour ...	...	...	...	...	...	ton	£10 to £10 10s.
Hay, Oaten ...	...	...	...	...	...	,,	£8 to £8 10s.
Hay, Lucerne ...	...	...	...	...	...	,,	£3 to £5 10s.
Honey ...	...	...	...	...	...	lb.	3d. to 3½d.
Maize ...	...	...	...	...	...	bush.	4s. 3d. to 4s. 4d.
Oats ...	...	...	...	...	...	,,	4s. to 4s. 6d.
Pollard ...	...	...	...	...	...	ton	£7
Potatoes ...	...	...	...	...	...	,,	£6 10s. to £8
Potatoes, Sweet ...	...	...	...	...	...	,,	...
Pumpkins ...	...	...	...	...	...	,,	...
Wheat, Milling ...	...	...	...	...	...	bush.	5s.
Wheat, Chick ...	...	...	...	...	...	,,	4s. 9d. to 5s.
Onions ...	...	...	...	...	...	ton	£9 to £9 5s.
Hams ...	...	...	...	...	...	lb.	11d. to 1s.
Eggs ...	...	...	...	...	...	doz.	1s. 1d. to 1s. 3d.
Fowls ...	...	...	...	...	...	pair	2s. 3d. to 4s.
Geese ...	...	...	...	...	...	,,	5s. 6d. to 6s.
Ducks, English ...	...	...	...	...	...	,,	3s. 6d.
Ducks, Muscovy ...	...	...	...	...	...	,,	4s. 7d.
Turkeys (Hens) ...	...	...	...	...	...	,,	7s. 3d. to 7s. 6d.
Turkeys (Gobblers) ...	...	...	...	...	...	,,	13s. 3d. to 16s. 6d.

ENOGGERA SALEYARDS.

[illegible]

Orchard Notes for September.

By ALBERT H. BENSON, M.R.A.C.

THE SOUTHERN COAST DISTRICTS.

The marketing of citrus fruits in the later districts, of the late winter or early spring crop of pines and bananas, also of strawberries and Cape gooseberries, will continue to occupy the attention of fruit-growers. I can only repeat the advice I have so often given in these notes respecting the marketing of all kinds of fruit—viz., to grade the fruit evenly, pack honestly, and display it to the best advantage if you want to get good returns.

September is a very important month to the fruit-grower, owing to the fact that it is usually a dry month, and that it is essential in all cases to keep the land in a high state of tilth, so as to retain the moisture that is required by the various trees that are in blossom, thus securing a good set of fruit. Where irrigation is available, it is advisable to give the trees a good watering should the ground be dry, as this will induce a good growth and cause the fruit to set well. If an irrigation is given, it should be a thorough one, not a mere surface watering, and once the land is saturated the moisture must be retained in the soil by constant and systematic cultivation. If this is done, one good watering will usually be enough to carry the trees through in good condition to the thunderstorms that come later or even to the summer rains, if the soil is of deep sandy, loamy nature.

No weeds must be allowed in the orchard or vineyard at this time of the year, as they are robbing the trees and plants of both the water and plant food that are so essential to them at this period of their growth.

There is not much to be done in the way of fighting scale insects during the month, as they are more effectually dealt with later on, but where young trees are showing signs of distress owing to the presence of scale insects they should be treated, the gas method being the most efficacious.

Beetles and other leaf-eating insects often make their appearance during the month. The best remedy is to spray the trees or plants with one or other of the arsenical washes that are recommended by me in this Journal. The vineyard will require considerable attention. Not only must it be kept well worked, but any vines that are subject to the attack of black spot must be sprayed from time to time with Bordeaux mixture. Disbudding must be carefully carried out, as this work is equally as important as the winter pruning, as it is the best means of controlling the future shape of the vine. A very common fault with vines grown in the coast districts is that the buds often remain dormant, only the terminal bud and possibly one other starting into growth, thus leaving a long bare space on the main rods, which is undesirable. When this takes place, pinch back those shoots that have started and which are taking the whole of the sap, and force the sap into the dormant buds, thus starting them into growth. This will result in an even growth of wood all over the vine, not a huge cane in one part and either a stunted growth or dormant buds in the rest.

Every care should be taken during the month to prevent the fruit fly from getting an early start. All infested oranges, loquats, kumquats, or other fruits should be gathered and destroyed, as the keeping in check of the early spring crop of flies, when there are only comparatively few to deal with, will materially lessen the subsequent crops.

Land that is to be planted to pines or bananas should be got ready now, though the planting need not be done till October, November, or even later. Prepare the land thoroughly; do not scratch the surface to the depth of a few inches, but plough as deeply as you have good surface soil, and break up the

subsoil as deeply as you can possibly get power to do it. You will find that the extra money expended will be a profitable investment, as it will pay every time.

TROPICAL COAST DISTRICTS.

September is usually a very dry month, and fruit trees of all kinds suffer in consequence. The spring crop of citrus fruits should be harvested by the end of the month, as if allowed to hang later there is a great risk of loss by fly. The fruit should be well sweated, and if carefully selected, well-graded, and well-packed it should carry well to and fetch high prices in the Southern States, as there are no oranges or mandarin grown in Australia that can excel the flavour of the best of the Bowen, Cardwell, Cairns, Port Douglas, or Cooktown fruit.

As soon as the fruit is gathered the trees should be pruned and sprayed with the lime and sulphur wash, as this wash is not only a good insecticide, but it will keep down the growth of all lichens, mosses, &c., to which the trees are very subject.

Every care should be taken to keep down the crop of fruit fly during the month. All infested fruit should be gathered and destroyed, particularly that in or adjacent to banana plantations. Watch the banana gardens carefully, and keep well cultivated. New land should be got ready for planting, and where land is ready planting can take place.

Papaws and granadillas are in good condition now, and if carefully gathered and well-packed in cases only holding one layer of fruit they should carry well to the Southern markets if sent in the cool chamber.

SOUTHERN AND CENTRAL TABLELANDS.

Prune grape vines at Stanthorpe the early part of month, leaving the pruning as late as possible, as the object is to keep the vines back in order to escape damage from late spring pests. All vines subject to the attack of black spot should be treated with the winter dressing when the buds are swelling, this treatment to be followed by spraying with Bordeaux Mixture later on.

Where fruit trees have not received their winter spraying, they should be treated at once before they come out into flower or young growth. Where the orchard or vineyard has not been ploughed, do so, taking care to work the land down fine as soon as it is ploughed, so as to keep the moisture in the soil, as the spring is always the trying time for fruit trees.

Look out for fruit fly in the late oranges and loquats in the Toowoomba district. Keep the orchards and vineyards well cultivated; disbud the vines where sufficiently advanced. Spray for codling moth.

In the Central tablelands irrigate vines and fruit trees, and follow the irrigation with deep, constant, and systematic cultivation. Keep down all weed growth, and fight the red scale on citrus trees with cyanide. The objective of the fruit-grower throughout Queensland during September and the two following months is, "How best to keep the moisture in the soil that is required by the trees, vines, plants, and vegetables," and this objective can only be obtained by irrigation when same is available, or by deep, systematic, and constant cultivation when there is no water available for irrigation.

Farm and Garden Notes for September.

FIELD.—Spring has now arrived, and with it there will be the usual trouble with weeds, especially on carelessly cultivated, uncleaned ground. Therefore, the cultivator, the horse and hand hoe must be kept vigorously at work to check the weed pests, save the growing crops, and much future labour. Attend to earthing up any crops which may require it. There may possibly

occur drying winds and dry weather; still, good showers may be looked for in October, and much useful work may be done during the present month, which will afford a fair prospect of a good return for labour.

Plant out *Agave rigida*, var. *sisalana* (sisal hemp plant), in rows 8 feet by 8 feet or 6 by 8 feet apart, according to the richness of the soil. All dry places on the farm, too rocky or poor for ordinary crops, should be planted with this valuable aloe; especially should limestone country be selected for the purpose. If the soil is very poor and the plants very small, it is better to put the latter out into a nursery of good soil, about 1 foot to 18 inches apart. Next year they will be good-sized plants. Keep down tall weeds in the plantation, and do not allow couch grass to grow round the roots. The sisal will do no good if planted in low, wet land, or on a purely sandy soil. It thrives best where there is plenty of lime, potash, and phosphoric acid, all of which can be cheaply supplied if wanting in the soil. Sow cotton, Sea Island near the coast and Uplands generally. Sow maize, sorghum, imphee, mazzagua, prairie grass, panicum, tobacco, and pumpkins. Sugar-cane planting should be vigorously carried on. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, ginger, and canaigre, the latter a bulb yielding a valuable tanning substance. Plant out coffee.

KITCHEN GARDEN.—Now is the time when the kitchen garden will richly repay all the labour bestowed upon it, for it is the month for sowing most kinds of vegetables. If the soil is not naturally rich, make it so by a liberal application of stable manure and compost; dig or plough the ground deeply, and afterwards keep the surface in good tilth about the crops. Water early in the morning or late in the evening, and stir the soil in the latter case early next day to prevent caking. Mulching with straw or leaves or litter will be of great benefit as the season gets hotter. It is a good thing to apply a little salt to newly dug beds. It is not exactly known what the action of salt is on the soil, but when it is applied as a top-dressing it tends to check rank growth. A little is excellent for cabbages, but too much renders the soil sterile, and causes hardpan to form. French or kidney beans may now be sown in all parts of the State. The lima bean delights in the hottest weather. Sow the dwarf kinds in drills 3 feet apart and 18 inches between the plants, and the climbing sorts 6 feet each way. Sow cucumbers, melons, marrows, and squashes at once. If they are troubled by the beetle, spray with Paris Green or London Purple. In cool districts, peas and even some beetroot may be sown. Set out egg-plants in rows 4 feet apart. Plant out tomatoes 3½ feet each way, and train them to a single stem either on stakes, trellis, or wire netting. Plant out rosellas. Sow mustard and cress, spinach, lettuce, vegetable marrows, custard marrows, parsnips, carrots, eschalots, cabbage, radishes, kohl-rabi, &c. These will all prove satisfactory provided the ground is well worked, kept clean, and that water, manure, and, where required, shade are provided.

FLOWER GARDEN.—Continue to plant bulbs as directed last month. Protect the plants as much as possible from cold westerly winds, which may still occur, notwithstanding the increasing temperature. Keep a good lookout for slugs. Plant out chrysanthemums, palms, and all kinds of tropical and semi-tropical plants. If hot weather should ensue after planting, water and shade must be given. Sow dianthus, snapdragon, coleus. Roses will now be in full bloom. Keep them free from aphis, and cut off all spent blooms. This latter work should be done in the case of all flowers. If you wish to save seeds, do not wait for the very last blooms, but allow some of the very best to go to seed. If you have any toads in the garden or bush-house, encourage them to take up their abode there. They are perfectly harmless in spite of their ugliness, and they destroy an astonishing number of insects injurious to plants. Fill up all vacancies with herbaceous plants. Sow zinnia, galliardia, amaranthus, cockscomb, balsam, sunflower, marigold, cosmos, summer chrysanthemum, coreopsis, portulacca, mesembryanthemum, calendula, &c.

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NOTICE.

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It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

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Agriculture.

THE AUSTRALASIAN WOOL MARKETS.

From the "Annual Review and Statistics of the Wool Market for the Season 1907-8," published by Messrs. Dalgety and Co., Limited, we extract the following interesting and valuable information:—

As regards forecasting the future of the wool market with certainty, however, it would appear that the faculty is possessed by no one, for the vastly fuller information that is available nowadays and the increased attention paid to the subject by experts, contrasted with past times, only seems to make it become more apparent that all endeavours to foretell the future are more or less labour in vain, and it is not a little hard that when all the known factors are favourable the expected result should be upset by a cause which can neither be controlled nor foreseen.

As regards the conditions which have prevailed in the Australasian selling centres during the past twelve months, it can well be said that never did a season open with brighter prospects and end so disappointingly. It was first expected that the output of wool for the past year would slightly eclipse the record of the previous season, and that the market would rule at a high level and exhibit only minor fluctuations. Prophecy as regards clip production was affected by the setting in of unseasonable weather, winter rains were insufficient, the lambing generally was a poor one, and of spring there was practically none—we moved from a dry winter into an early and hot summer.

The net result of the conditions recorded is that, though the further increase in sheep numbers for the year is 5,075,555, the total clip of the past season (for export) has fallen short of its predecessor by 32,357 bales, the actual output being 2,057,831 bales in 1907-8, as against 2,090,188 in 1906-7. It is of the utmost importance to note that the actual decrease in production is much heavier than statistics given in *bales* indicate. For some years we have drawn attention to the custom, which has continued to grow amongst flockmasters, of putting less and less wool into a bale, and we are pleased to be able to present for the first time statistics as regards production in actual pounds weight, from which it will be seen that the 2,090,188 bales produced during 1906-7 season averaged 339.7 lb., totalling in all 710,168,448 lb., whereas the past year's output (for export) of 2,057,831 bales have averaged but 333.7 lb., or a total of 686,810,010 lb., showing that the actual decrease amounted to 23,350,438 lb. This, at the average weight of 333.7 lb. per bale, gives a total decrease in the past exportable clip of 69,975 bales.

When speaking of wool production for the year, it is also as well to mention that, though the actual amount of clean wool produced is always a matter more or less of surmise, there is no disputing the fact that the past clip from Australasia would not yield, after scouring, anything like so good a percentage as the better grown clip of 1906-7. Supposing the difference in shrinkage between the two clips to be 3 per cent. in favour of the 1906-7 output, it would mean that the amount of actual clean scoured wool produced during the past year (basing the 1906-7 clean washed yield at 47 per cent. on average, and that of 1907-8 at 44 per cent.) has been 31,500,000 lb. less than during the preceding twelve months. We do not think that we will be accused of exaggeration in saying that the past clip would yield clean scoured 3 per cent. less than that of 1906-7, nor for mentioning that the quantity of tops (combed wool) that would be obtainable would show a very much heavier decrease than the figures dealing with actual output of wool show, for the past clip was distinctly disappointing, and will be remembered for the scarcity of good warp wools and the over-abundance of those short-stapled, tender, and burry sorts which give such a very large percentage of noils to top.

The redeeming feature of the clip was its fine quality.

The average of the five years 1901-1905 was only 2·61 lb. per head, but the average of the last two years comes out again at 2·73, or very near the average of the ten years 1891-1900. The figures for last year were, however, quite exceptional.

There will be diminishing supplies, at any rate, during 1908 and 1909, and values should pursue an upward course as soon as confidence is sufficiently restored and the trade realises that the past clip from Australasia shows a shrinkage, and that the next one will do likewise.

That the world's output of gold and wheat have a preponderating influence upon the general prosperity of trade, there is no gainsaying. Upon examining the gold output, it is found that the steady increase recorded for some years almost ceased in 1907, the figures for some recent years being as follows:—

WORLD'S OUTPUT OF GOLD.

1904	...	...	...	...	...	£69,818,000
1905	...	...	...	...	...	75,682,000
1906	...	...	...	...	...	81,844,000
1907	...	...	...	...	...	82,298,000

The rapid expansion in production from 1904 to 1906 no doubt assisted towards the general prosperity of trade, which developed in 1907 out of proportion to the gold output. . . .

RESULTS TO PRODUCERS.

The 1,351,121 bales which were realised upon in Australasian markets averaged £13 0s. 2d. per bale, and, presuming that that portion of the clip which has been sent direct to London will do likewise, the net gain in wealth from wool production in Australia and New Zealand (for export) for the past twelve months will have been £26,768,952, which, though £2,816,788 less than the preceding year, eclipses that of 1905-6 by £1,507,941, and that of 1904-5 by £6,576,268.

It may be argued that the wool which has been forwarded to London for realisation will not sell at such high prices as the 1,351,121 bales which passed through the local auction rooms, and neither will it; but the average net return to Australasia per bale should be about the same, for, as has been pointed out in previous reviews, most of the wool sent to London for sale is composed of straight lines of the better classes of station clips (mostly fleece) and a much larger percentage of scoureds than is sold in the colonies.

The information tabulated hereunder, covering a period of years, showing number of fleeces per bale and number of bales per 1,000 sheep, demonstrates how many more bales are now filled by the wool from 1,000 head of sheep than was the case, say, ten years ago. The differences noticeable in the present day figures can be set down to two causes, viz.:—

1. Improvement in flocks; and
2. Increased proportion of crossbred wool.

The comparative statement referred to, compiled in accordance with latest sheep returns, is as follows:—

Year.	No. of Fleeces per Bale.			No. of Bales per 1,000 Sheep.	
1896-7	...	...	59·65	...	16·75
1897-8	...	...	60·08	...	16·64
1898-9	...	...	59·62	...	16·76
1899-1900	...	...	57·95	...	17·25
1900-1901	...	...	55·88	...	17·89
1901-2	...	...	55·42	...	18·04
1902-3	...	...	51·36	...	19·46
1903-4	...	...	55·51	...	17·99
1904-5	...	...	52·70	...	18·97
1905-6	...	...	50·27	...	19·89
1906-7	...	...	49·65	...	20·13
1907-8	...	...	52·90	...	18·90

NOTE.—The greater number of sheep shorn per bale, &c., during last year is attributable to shorter period for growth of fleece already referred to.

Though the pastoral industry has been fairly profitable as regards income from wool, &c., it is regrettable that over the most heavily stocked portions of Australia droughty conditions have prevailed. Fortunately, the almost unheard of drought which had ruled in parts of New Zealand was terminated in the autumn, while the good rains, which fell over most of the drought-infected areas of Australia during May and June, have been concurrent with an appreciation in wool values to the extent of from 12 to 15 per cent. above the very low level to which they had sunk in April and the early weeks of May.

Australasia is so largely dependent upon the pastoral industry for her wealth—wool and kindred products amounting in value to £45,000,000 out of the total exports of £90,000,000—that a drought or heavy decline in wool values is nothing less than a national calamity. It is satisfactory that producers have been so favoured of late years that they were never better able to withstand the, let it be hoped, temporary check to production and lower wool values which have to be recorded. Though the latter has assumed very serious proportions, and can be set down as averaging 30 per cent. as compared with rates current at the opening of the selling season, it must be remembered that values were at a very high level during the first few months of the period under review, and consequently the average value per bale recorded for the whole does not show anything like that decline, notwithstanding that the diminished weight of the bales has operated adversely upon the gross value realised for same.

The position of Australasia to-day is pre-eminently a sound one, and though the immediate returns from pastoral properties are not likely to be so satisfactory as they have been of late years on account principally of lower values, there is every likelihood, given seasonable conditions, of a return to good earnings ere long, for evidence all points to a sure though perhaps slow recovery in wool prices. From a pastoral standpoint, confidence in the position has at no time been shaken, for, concurrently with a fall in prices for station produce, land values have continued to advance.

The weather, as we go to press, is also more seasonable, and, though wool values during the coming year may be low in comparison with recent years, the outlook as regards Australasia's staple industry is not a gloomy one.

American and other buyers know that they must operate in these markets if they want first choice of each year's production, besides which, of course, there is a great saving of freight and time by shipping direct to Boston, &c. During the past twelve months, purchases on U.S.A. account in Australasia, as already mentioned, amounted to 56,571 bales, as compared with 20,000 bales bought for the same destination in London. As stocks of wool in U.S.A. were never lower than at present, and the domestic clip is only equal to supplying half the country's wants, a return of a better feeling in that republic, of which signs are not wanting, should be accentuated by a satisfactory outcome of the Presidential election to be held in November next.

All those buyers who are most intimately known in the Australasian trade are to be sympathised with, for, never mind how assiduously and carefully they performed their heavy duties, nothing has turned out right; wool which they bought cheap one day was dear the next, added to which the past clip was evidently a most deceptive one as regards yield, for most experts acknowledge that they over-estimated same when valuing. They have had the market always against them, and a deceptive and unsatisfactory clip to deal with, with the result that interviews with principals during the past few months have not been anything like so pleasant as they were last year.

A general complaint with manufacturers nowadays is that they are asked to make so many patterns, and often get orders for one suit length of this or that, whereas formerly they sold a larger proportion of standard cloths. The majority of manufacturers hope for a steady wool market at the lower range of values which has of late been established, preferring large supplies on steady markets.

Though the Japanese have taken less wool than in 1906-7, they are likely to compete keenly for good scoured merinos at any time; whilst China, which up till this has not been a customer for Australian wool, will be in the future, for extensive woollen mills have recently been erected at Tientsin and Shanghai. When that vast nation, which slowly but surely is following Japan, wakes up to the advantages of woollen garments, what vast possibilities there will be for extending our trade in the East!

The following table of figures will show how various sections of the trade supported the market. Buyers from the British Isles took 481,543 bales, as compared with 424,000 bales in 1906-7; France, Belgium, and Holland, 415,476, as against about 480,000 last year; Germany, 266,508, as against about 320,000.

The greatest falling off in purchases, however, was on U.S.A.-Canadian account; totals secured for North America being 56,571 bales during 1907-8, as compared with 136,613 bales during the preceding year:—

	1907-8.		1906-7.	
	Bales.	Percentage to Total Purchases.	Bales.	Percentage to Total Purchases.
United Kingdom ...	481,543	36%	424,307	28%
Continent of Europe ...	719,560	53%	848,635	55%
U.S.A. and Canada ...	56,571	4%	136,613	9%
Japan, China, India ...	13,288	1%	37,266	2%
Local manufacturers, &c.	80,159	6%	90,977	6%
	1,351,121		1,537,798	

The highest price for greasy merino fleece in the Australasian markets during the past season was 20½d. per lb., which was obtained in Geelong for DR/Blackwood, 5 bales. In Melbourne, the honour list was topped at 17¾d. for Koolomort, 7 bales; and in Sydney by 17½d. for Cooyal, 4 bales.

Once again by far the larger proportion of the clip has been dealt with in Australasian markets, and again the policy of the majority has proved correct. Taking into consideration that the fall in values acted in the nature of a temptation to ship, it is worthy of note how consistently woolgrowers have supported their own markets in preference to taking risks which on former occasions have proved so disastrous. The pity is that every bale was not sold on this side, for shippers have, indeed, fared badly in London, where realisations so far made have resulted in a loss on the average of about £4 per bale.

Our limited space will not permit of further very interesting information in connection with the wool trade of Australasia and New Zealand; we therefore reluctantly conclude our résumé with a

SUMMARY OF STATISTICS.

Summarising the past year, it is of the utmost importance to note that, after taking into consideration reduced weights of bales, the actual decrease in oversea wool exports from Australasia, as compared with the preceding year, amounts to 69,975 bales, or 23,350,438 lb.

The total amount of the clip available for export has been 686,810,010 lb., as against 710,168,448 lb. in 1906-7 season.

The average value per bale of all the wool sold in Australasia during the past twelve months was £13 0s. 2d., as compared with £14 3s. 11d. for the previous year—a decrease of £1 3s. 9d., or 8·36 per cent.

The tendency on the part of growers to still further reduce the weight of their wool bales, which we referred to twelve months ago, has continued, with the result that the average weight per bale of the past clip has amounted to 333·7 lb., as against 339·7 lb. during the previous season, showing a reduction of 6 lb.

For the twelve months ending 30th June, 1908, 1,351,121 bales sold in Australasia realised £17,577,249; for the same period to 30th June, 1907, 1,537,798 bales grossed £21,835,131. Decrease for the year, £4,257,882.

The total exportable production of Australasia has amounted to 2,057,831 bales, which, if taken at £13 0s. 2d. per bale, shows the value to be £26,768,952. But to the above must be added 80,159 bales which have been manufactured into cloth, &c., in the Commonwealth and Dominion, say £1,042,735 worth. Thus the total production is estimated to have yielded £27,811,687. This is assuming that the wool which has been exported direct to London for sale shows the same net return per bale as has been obtained in colonial centres.

The previous year's exportable surplus of 2,090,188 bales was valued at £29,585,740, so that the exportable surplus of 1907-8 shows a decrease of wealth to Australasia from wool of £2,816,788.

By dividing the total number of sheep depasturing in the Commonwealth and New Zealand—viz., 108,871,681—into the net weight of wool produced, including that used for local manufacturers—viz., 713,567,068 lb.—it will be seen that the average weight of wool produced per head works out at 6 lb. 9 oz., which compares with 7 lb. 2 oz. in 1906-7. The average monetary return has been 5s. 1d. per head of sheep and lambs, as against 5s. 11d. for the previous season; the falling off in weight of wool produced per head and the lesser monetary return being attributable to the facts that a large proportion of the sheep had but ten to eleven months' growth of wool on when they were shorn, poorer general condition of the last clip, and lower average of values ruling than in 1906-7.

The quantity of lambs' wool dealt with in Australasia during the past twelve months amounts to 70,980 bales, as compared with 105,873 bales for the season 1906-7, a decrease of 34,893 bales.

The proportion of lambs to fleece sold was 5 per cent., as compared with 7 per cent. the previous year, the declining percentage being due to the poorer lambing of the past season.

The proportion of scoured wool sold in Australasian markets has been but 9 per cent., as compared with 11 per cent. during the previous year.

The number of sheep in Australasia at 31st December last amounted to 108,871,681, an increase of 5,075,555 as compared with corresponding date in 1906.

The total slaughterings of sheep and lambs for local consumption and export combined were 17,059,780 during the year 1907, which compares with 15,637,087 during 1906.

VALUE OF AUSTRALASIAN CLIP.

As showing the vastly preponderating influence of the wool clip upon the prosperity or otherwise of Australasia, the following figures, taken from the official Year Books of the Commonwealth and New Zealand, giving comparison of values of wool shipments with total exports (January-December period), are of great interest and use, viz. :—

		Total Value Exports.	Total Value Wool Exports.	Percentage of Wool to Whole.
1881	...	£48,728,240	£16,136,082	33·11
1891	...	72,705,247	24,063,227	33·09
1896	...	66,545,374	20,433,855	30·77
1901	...	62,386,632	18,936,557	30·35
1902	...	57,413,686	16,109,026	28·05
1903	...	63,088,304	18,042,873	28·59
1904	...	72,087,702	21,796,096	30·23
1905	...	72,344,565	25,203,549	34·83
1906	...	87,578,109	29,411,424	33·58
1907	...	92,975,271	35,267,851	37·93

ON THE SELECTION OF PHOSPHATES.

On the above subject, we have received the following notes from their author:—

It is not necessary to state that phosphate of lime is essential for the improvement of grass land and the production of large and healthy crops of turnips and swedes. The farmer's difficulty is to select the particular kind of phosphatic fertiliser that is best adapted to his particular kind of soil. Until the last few years it seemed to be taken for granted that superphosphate or dissolved bones should be considered the most suitable phosphates for spring application, irrespective of the character of the soil. But the wonderful results that have followed the judicious application of basic slag on coarse pasture and heavy clay has afforded a very striking and very practical illustration that one kind of manure is not suitable for all kinds of soils, and that there are conditions under which a hard fused mass possessing an alkaline character, and but little soluble in ordinary water, if finely ground, is capable of producing better results than was formerly obtained from the use of a very soluble but acid manure. The very general manner in which all kinds of manures appear to be forced upon the farmer's notice adds very considerably to his difficulty in making a selection. It would certainly be a convenience if the merits of any particular fertiliser were put forth by the sellers in a modified and somewhat restricted manner, that fertilisers should not be described as suitable for all soils and all crops, but rather for certain soils and certain crops. If this were done, the future results would be more satisfactory to sellers and buyers. Farmers would know what to buy, and would not be disappointed with the results, while sellers would soon find out the districts where their manures gave the best results, and their sales would be greatly increased. With a view of assisting in the selection during the coming season, the following remarks are offered in regard to the three principal kinds of phosphate fertilisers and the particular soils for which they are respectively adapted:—

SUPERPHOSPHATE

supplies phosphate of lime in the most soluble form that can be obtained, and is specially suitable for all good arable soils containing plenty of lime. When carefully manufactured from high-class mineral phosphates, the percentage of phosphate of lime rendered soluble in water, and, therefore, readily available, varies from 25 per cent. to 35 per cent., and where carriage is costly the higher quality will be found to be the most economical. In order, however, to get the full benefit from this valuable fertiliser, it is absolutely necessary that the soil should contain plenty of lime—at least 5 per cent.—because the acid phosphate, which is harmful to vegetation, requires to be neutralised by the alkali lime, and rendered alkaline before it can be absorbed by the minute rootlets of the plant. A shrewd Jersey farmer once told us that he always selected a dry day for top-dressing his clover seeds, because he found that in damp weather, or when there was a heavy dew, the clover leaves were blistered and scorched by the acid nature of the superphosphate. Anyone can soon see the injurious effect of throwing superphosphate over the leaves of plants, and the minute rootlets are still more sensitive. The superior value of water-soluble phosphate of lime is due to the fact that its great solubility promotes more perfect and extended diffusion through the soil, and not, as is sometimes supposed, to the direct absorption by the rootlets of the acid phosphate of lime. Pure dissolved bones are superior to superphosphate, because they supply nitrogenous organic matter, in addition to phosphate of lime; but hitherto manufacturers, out of deference to the farmers' desire to see the bones in the manure, have not carried the dissolving process with sulphuric acid sufficiently far to render the bones completely soluble, as the term "dissolved bones" would naturally lead us to conclude was the case. Consequently, as most of the phosphate of lime and nitrogen compounds still remain in an insoluble form,

such so-called dissolved bones are naturally more suitable for soils somewhat deficient in lime rather than for soils which abound in lime.

BASIC SLAG (THOMAS' PHOSPHATE),

when first introduced as a fertiliser, about the year 1883, was little appreciated by scientific men of high authority, on account of its origin as a hard, fused, refuse rock-like material from the iron-ore blast furnaces, and its little solubility—only about 6 parts being dissolved by 100 parts of ordinary water. Farmers, however, in the Midland counties were induced to take small quantities for trial, chiefly on their old grass land, and as the results on certain soils, rich in vegetable matter but poor in lime, were satisfactory, scientific authorities were obliged to admit its agricultural value as a fertiliser on certain soils. It is important to recognise the fact that basic slag is only suitable for certain kinds of land, such as damp heavy clay, deficient in lime, but containing plenty of acid vegetable matter, which, in the presence of moisture, rapidly decomposes the powdered slag, and liberates lime as well as phosphoric acid in a condition readily available for plant food. It is a mistake to recommend basic slag as being suitable for all soils; farmers know that its application, though most beneficial to certain land, has failed to produce any beneficial results upon other kinds of land. It is more economical to adapt the manure to the soil rather than to adapt, or try to adapt, the soil to the manure. Basic slag varies in its contents of phosphate of lime from 30 per cent. to 40 per cent., and sometimes 45 per cent., and lime from 40 per cent. to 50 per cent., also in the fineness of the grinding, so that it is necessary to stipulate for a guarantee as to its chemical composition and mechanical condition, for the grinding should be such that 80 per cent. to 90 per cent. should pass through a sieve of 10,000 holes to the square inch. It has been stated that this material contains as much as 20 per cent. of free caustic lime, but this is not the case, because any such quantity would indicate a wasteful method of manufacture, for lime is only added in sufficient quantity to remove the phosphorus and silica originally present in the iron ore. The actual amount of free caustic lime in ordinary slag does not exceed 3 per cent. to 4 per cent., and its mild alkaline character, as compared with quicklime, can easily be ascertained by putting equal quantities of these materials into tumblers of cold water and testing the solution after standing and stirring for a few minutes. Most of the lime is present in a combined form, such as phosphate of lime and basic silicate of lime, from which latter compound it derives the name of basic slag. In order to dissolve such compounds, it is requisite that the soil water should be acid, for, as already pointed out, ordinary water has but a very slight dissolving effect upon such a hard fused mass, however finely ground the powder may be. It will be gathered from the foregoing remarks that basic slag, though a most useful manure, can only be profitably applied to certain kinds of soil.

BASIC SUPERPHOSPHATE

consists of superphosphate which has been made alkaline by the admixture of finely-ground or lightly slaked lime in sufficient quantity to convert the original mono-calcic or water-soluble phosphate into di-calcic, or citric-soluble phosphate, with a slight excess of caustic lime. This fertiliser was introduced in the spring of 1901, and is manufactured by a syndicate consisting of ten of the largest firms in England, Scotland, and Ireland, so that there should be no difficulty in obtaining it anywhere. The material has a white appearance, and is in a very light, powdery state, occupying fully two and a-half times the space of slag, and, when sown broadcast by hand, does not fall between the fingers before delivery, as in the case of slag. It contains about 35 per cent. of lime and 26 per cent. of phosphate of lime, which, though not soluble in water, is readily soluble in a very weak solution of citric acid,

containing 1 part of citric acid in 1,000 parts of water, which represents an acidity less than that possessed by the acid juices of the rootlets of plants, so that all the phosphate of lime so dissolved may be fairly regarded as available plant food. It combines the valuable alkaline character of basic slag with the well-known solubility of superphosphate, but is free from the defects of these opposite manures—namely, the comparative insolubility of slag and the injurious acidity of superphosphate. If 1 part respectively of basic superphosphate and basic slag are separately exhausted with 1,000 parts of weak citric acid solution (1 in 1,000) for twenty-four hours, with occasional stirring, it will be found that 90 per cent. of the former has been dissolved, compared with 40 per cent. of the latter. The new manure is intended to occupy an intermediate position between acid superphosphate and alkaline slag, and to be applied for intermediate descriptions of soil. It is not intended to supersede the use of superphosphate upon good arable land containing plenty of lime, nor is it intended to take the place of well-ground slag upon sour grass land, damp, heavy clay or rich vegetable soils; but it is specially intended for soils deficient in lime, such as light clay, gravel, granite, and sandy soils, the united acreage of which represents such a large proportion of the cultivated area of the United Kingdom. It has been found particularly useful for turnips when sown on land subject to finger-and-toe, and should be drilled with the seed at the rate of 5 cwt. per acre. On this point, interesting details will be found in Dr. Voelcker's report of experiments with turnips on soil subject to finger-and-toe at Woburn, published in the Royal Agricultural Society's journals for 1905 and 1906. It is hoped that farmers will derive some assistance from the above remarks in selecting for the coming season the particular kind of phosphatic fertiliser which is best adapted to their particular soil.

JOHN HUGHES,

Agricultural Analyst for Herefordshire.

Analytical Laboratory,

79 Mark lane, London E.C.

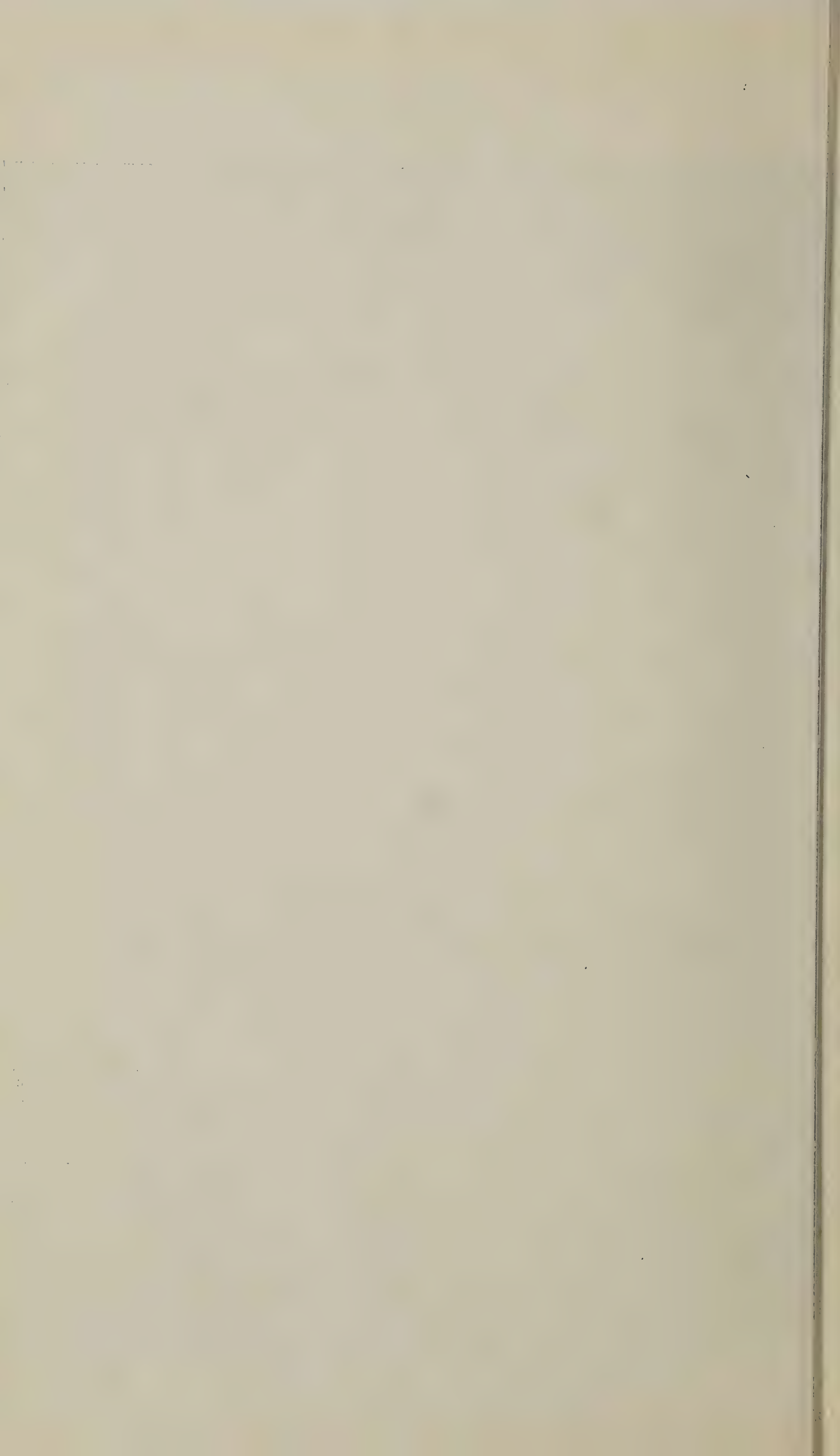
THE AGRICULTURAL COLLEGE AND STATE FARMS' EXHIBITS AT THE EXHIBITION.

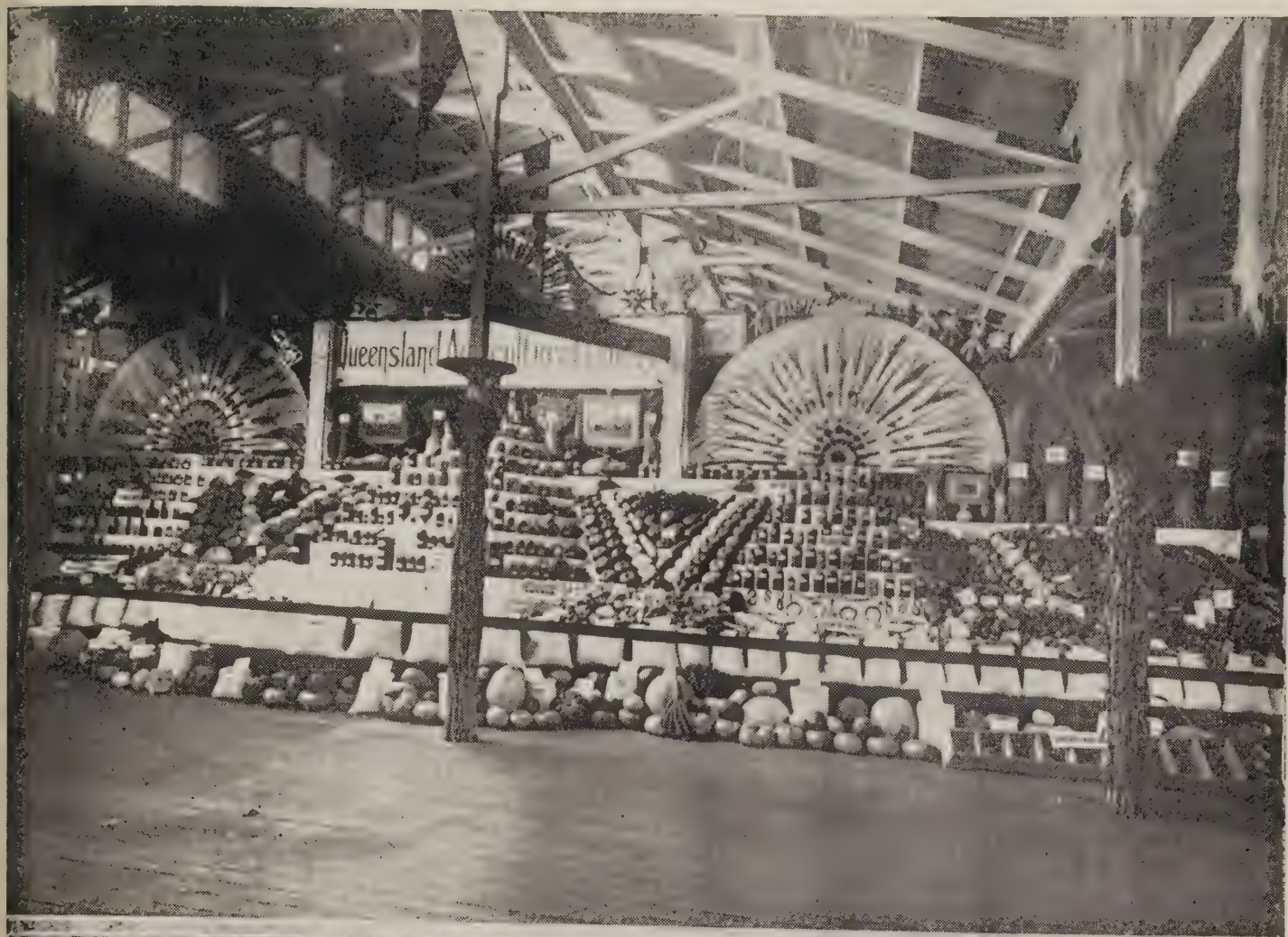
Although the District Exhibits from the Lockyer, New England, and the Central Districts embrace a greater variety of industries than is possible in the case of the College and State Farms, yet the latter must be considered amongst the most interesting and attractive courts at the late Exhibition at Bowen Park, and they deservedly attracted crowds of appreciative visitors. The art of arranging a court and the exhibits is one demanding a long apprenticeship; and the managers of the State institutions named, which also include the Kamerunga State Nursery at Cairns, have exhibited so often during the past ten years that they have become past masters in the art of displaying the various products of the soil in the most attractive manner, and not less in describing with infinite patience, day and night, the methods by which the splendid results have been achieved. Taking the Departmental exhibits right through, it cannot but be said that master minds directed the laying-out of the courts, which were full of interest and instruction, not only to agriculturists, pastoralists, horticulturists, and all primary producers, but also to scientists, and to those who are now arriving in considerable numbers from the Southern States and from Europe with the view of settling amongst us as farmers and graziers or of investing capital in some of the many profitable industries which the vast resources of the State present to them.

We do not propose to go into the various details of the courts, as that work is ably done by the hundreds of newspapers which circulate through the

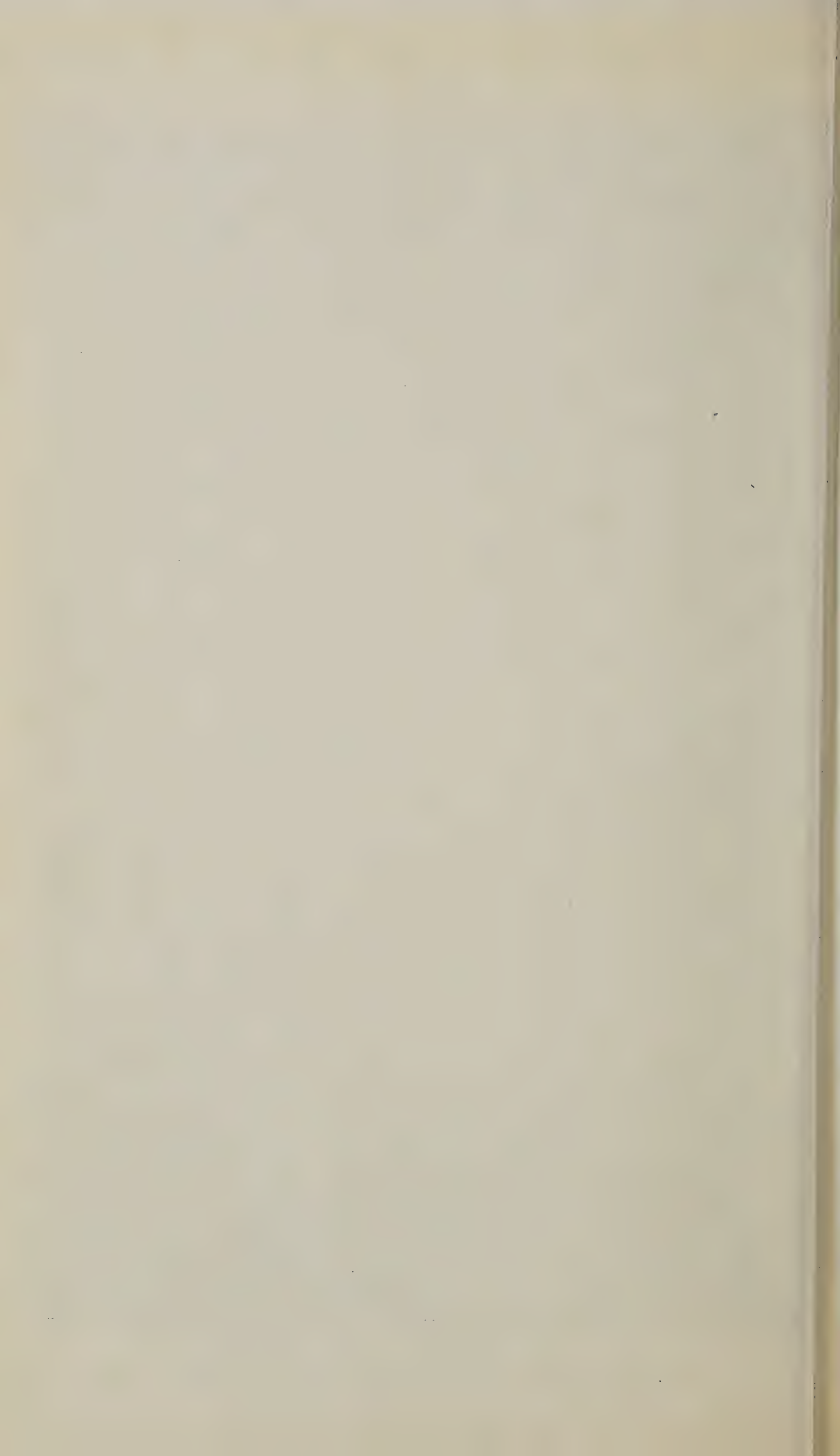


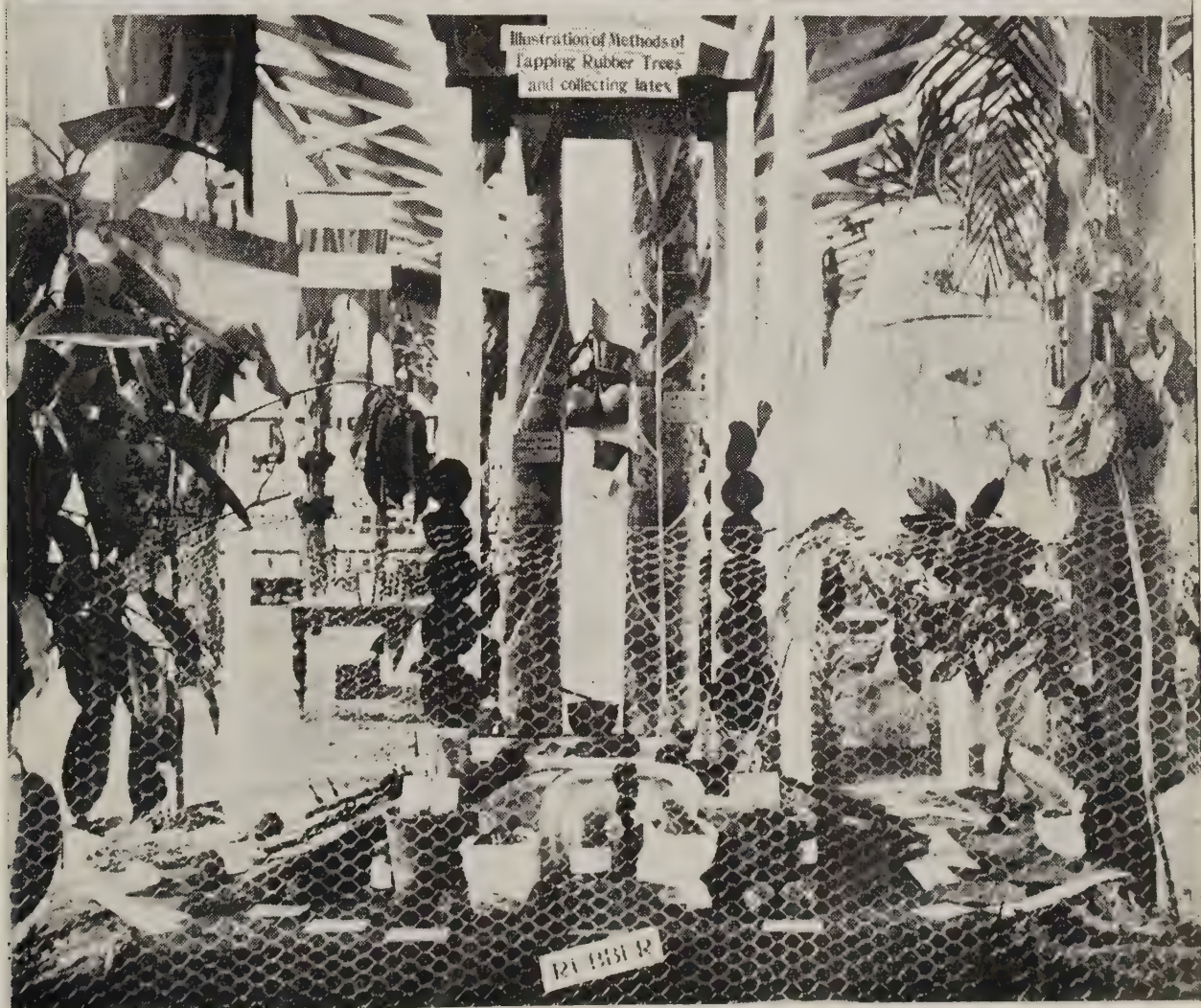
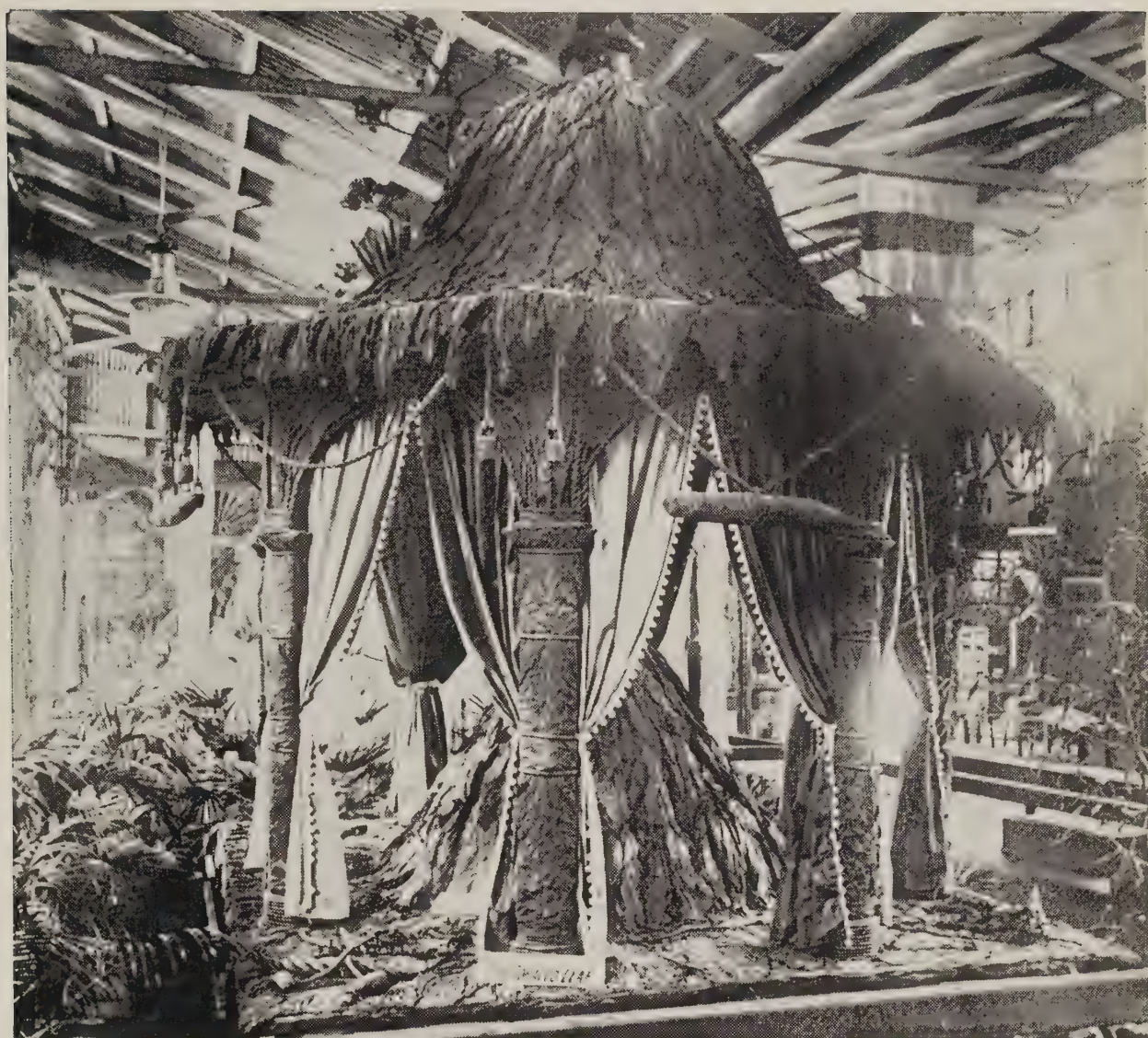
AGRICULTURAL COLLEGE AND STATE FARM COURTS AT THE NATIONAL ASSOCIATION'S EXHIBITION, AUGUST, 1908.





1. EXHIBITS OF THE QUEENSLAND AGRICULTURAL COLLEGE.
2. EXHIBITS OF THE WESTBROOK AND HERMITAGE STATE FARMS.





1. TOBACCO TROPHY IN THE STATE FARMS COURT.
2. RUBBER EXHIBIT FROM KAMERUNGA STATE NURSERY.

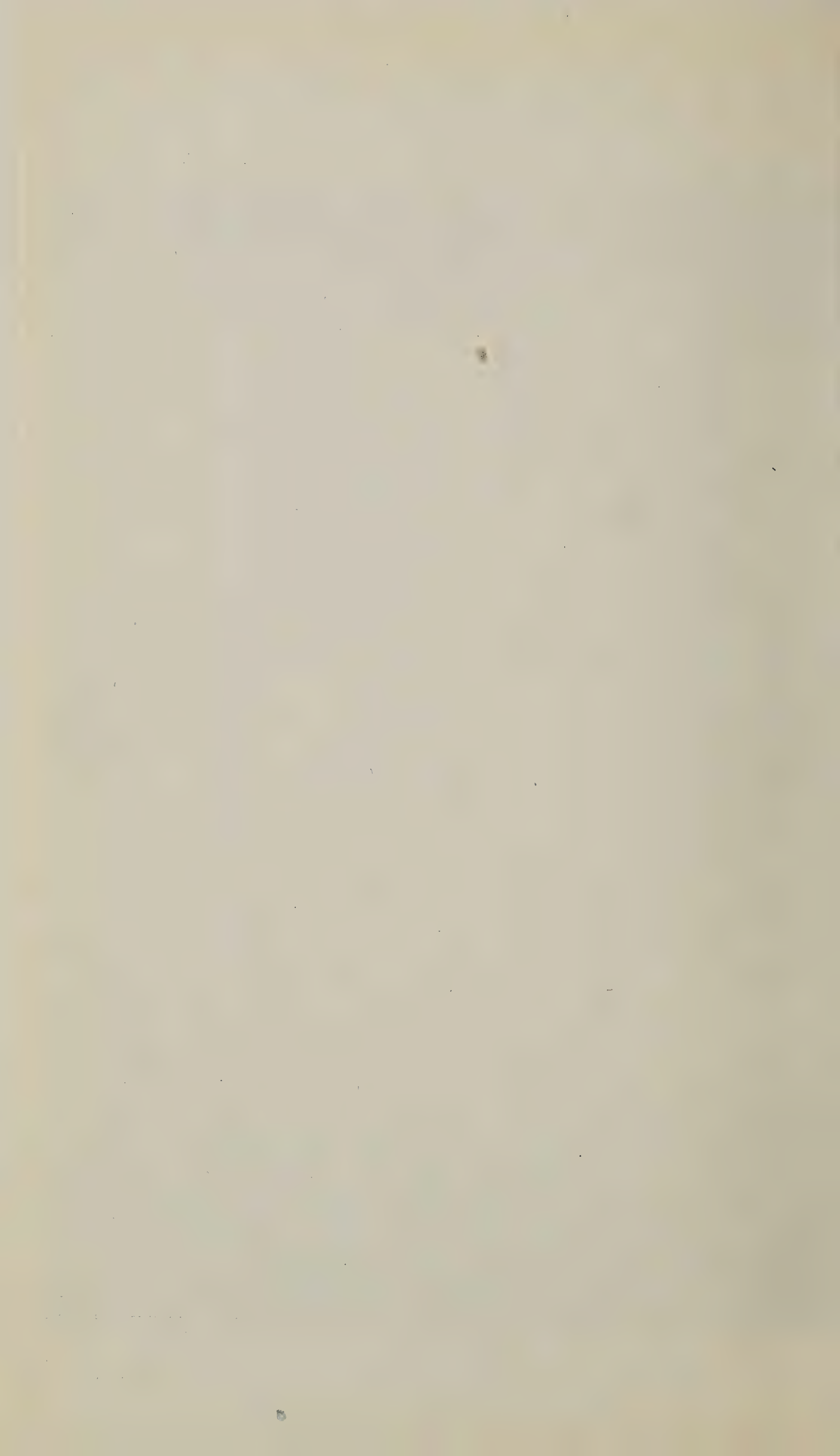


SISAL HEMP EXHIBIT, GROWN AND MANUFACTURED AT H.M. PENAL ESTABLISHMENT, ST. HELENA.

Plate XXIV.



EXHIBIT OF RAW AND MANUFACTURED SISAL HEMP, GROWN AT FARNBRO', CHILDERS, BY
T. H. WELLS, ESQ.





1. EXHIBITS FROM THE KAMERUNGA STATE NURSERY, CAIRNS.
2. THE CENTRAL DISTRICTS. (The First Prize was awarded to this Court at the National Association's Exhibition, August, 1908.)

whole State, even to its remotest confines, and which are doubtless read by all who receive this Journal. We should, however, mention a unique exhibit which appeared for the first time at the late Exhibition—that is, the sisal hemp exhibited, on a commercial scale, in the form of marketable bales, coils of rope, binder twine, and other forms in which the fibre is prepared for the market, by Mr. T. H. Wells, of Farnbro', Childers. That gentleman has entered largely upon the cultivation of the sisal plant, and has imported the best machinery for treating it. He has encountered many difficulties in bringing his plantation to the manufacturing point, and, as he says, "It pays." This exhibit deservedly took first prize. In the Departmental court there was a beautiful trophy of fibre from St. Helena, and also a most artistic temple or kiosk made entirely of tobacco leaf. The pillars, with Corinthian capitals, the flutings, architraves, and, in fact, everything architectural, were twisted out of tobacco leaf, whilst the beauty of the structure was enhanced by gracefully-looped curtains (the work of a lady, by the way), and at night it was illuminated by a chandelier of electric light.

We were genuinely pleased to note that the District Exhibit from Central Queensland carried off first honours this year, but what does not please us is to see the apathy or want of patriotism of some districts which could show an infinite variety of products peculiar to their part of the State. From Torres Strait to Cape Byron, from the coast to the far West, an infinite variety of raw and manufactured products, which only exist in certain localities, could be shown. It no doubt entails great expense, and, what is more to the point, great personal exertion, to get together a large district exhibit; but it should be always borne in mind that such exhibits not only advertise the State, but they put forward, by ocular demonstration, the claims of the districts as desirable places for settlement, their claims for railways, harbour improvements roads, bridges, &c., &c., and these means of advertising portions of the State are far more potent than scores of deputations. We must not omit to mention one remarkable exhibit, also appearing for the first time in the section occupied by the Kamerunga State Nursery—that is, the rubber exhibit. Here it was to be seen in all stages of growth (old age excepted, of course), from the seed to the tapping of the tree to obtain the latex. It was an object lesson which needed no lecturer. Mr. Newport had so excellently arranged the exhibit that he might have placarded it "A Silent Lesson in Rubber Production," as did Mr. C. Ross, of Westbrook State Farm, when he exhibited the art of vine-pruning, and labelled it "A Silent Lesson in Pruning Vines." We hope that next year there will be several more districts competing for the coveted honour of "nulli secundus." It is remarkable that on one single day of the Exhibition one-tenth of the adult population of the State was present on the grounds

BRITISH APPRECIATION OF THE JOURNAL.

Since the inception of the "Queensland Agricultural Journal" in July, 1897, the editor has always endeavoured to carry out the objects for which it was established, and which were duly set forth in the first issue; and, judging by the appreciation of it not only by Queensland farmers, cane-growers, orchardists, dairy farmers, &c., but by farmers in many other parts of the world, it would appear that the Journal meets with general approval.

Some little time ago a request was received by the Queensland Department of Agriculture from the South-eastern Agricultural College at Wye, Kent (Eng.), for copies of the "Queensland Agricultural Journal," which they required to complete their files. A letter has now been received from the librarian of the college acknowledging receipt of the copies, and stating that in his opinion it is the best "Agricultural Journal" they receive from any of the colonies.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

RECORD OF COWS FOR MONTH OF JULY, 1908.

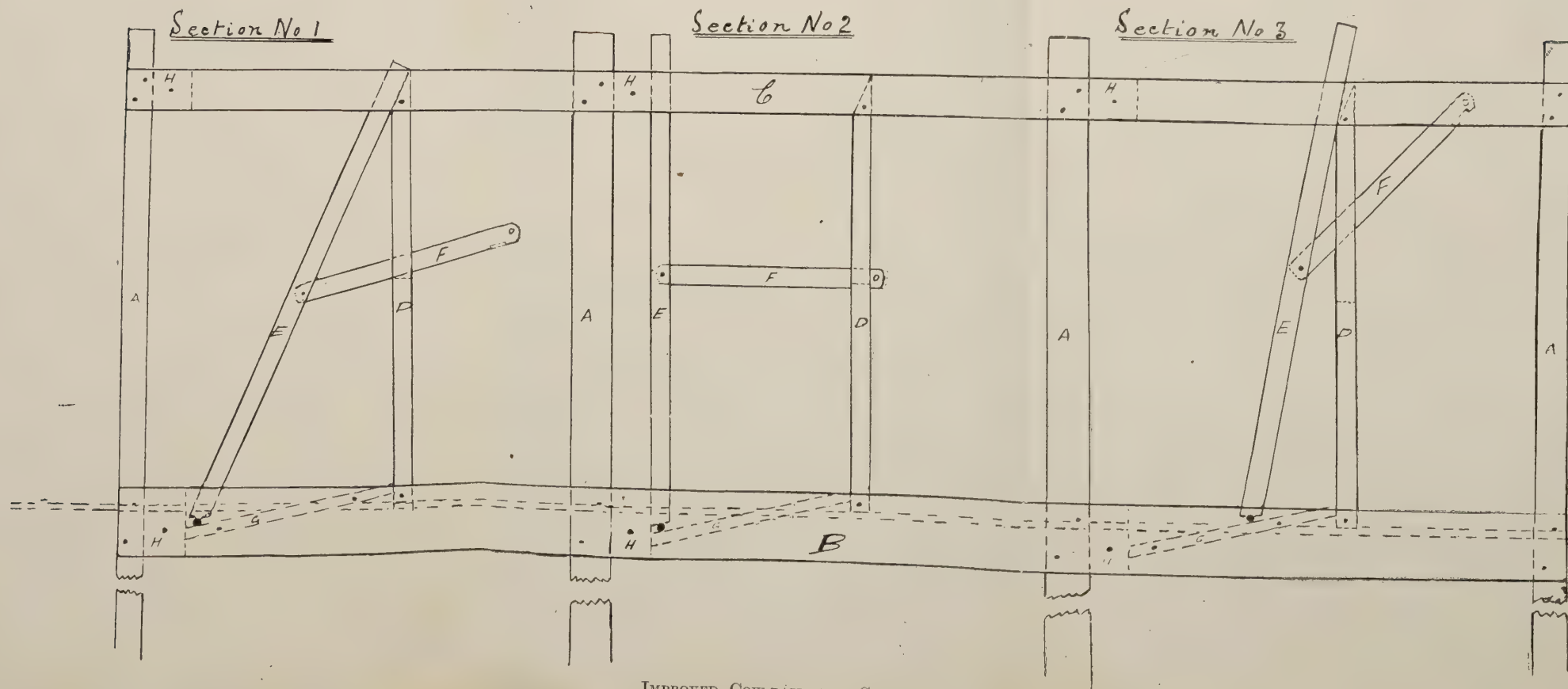
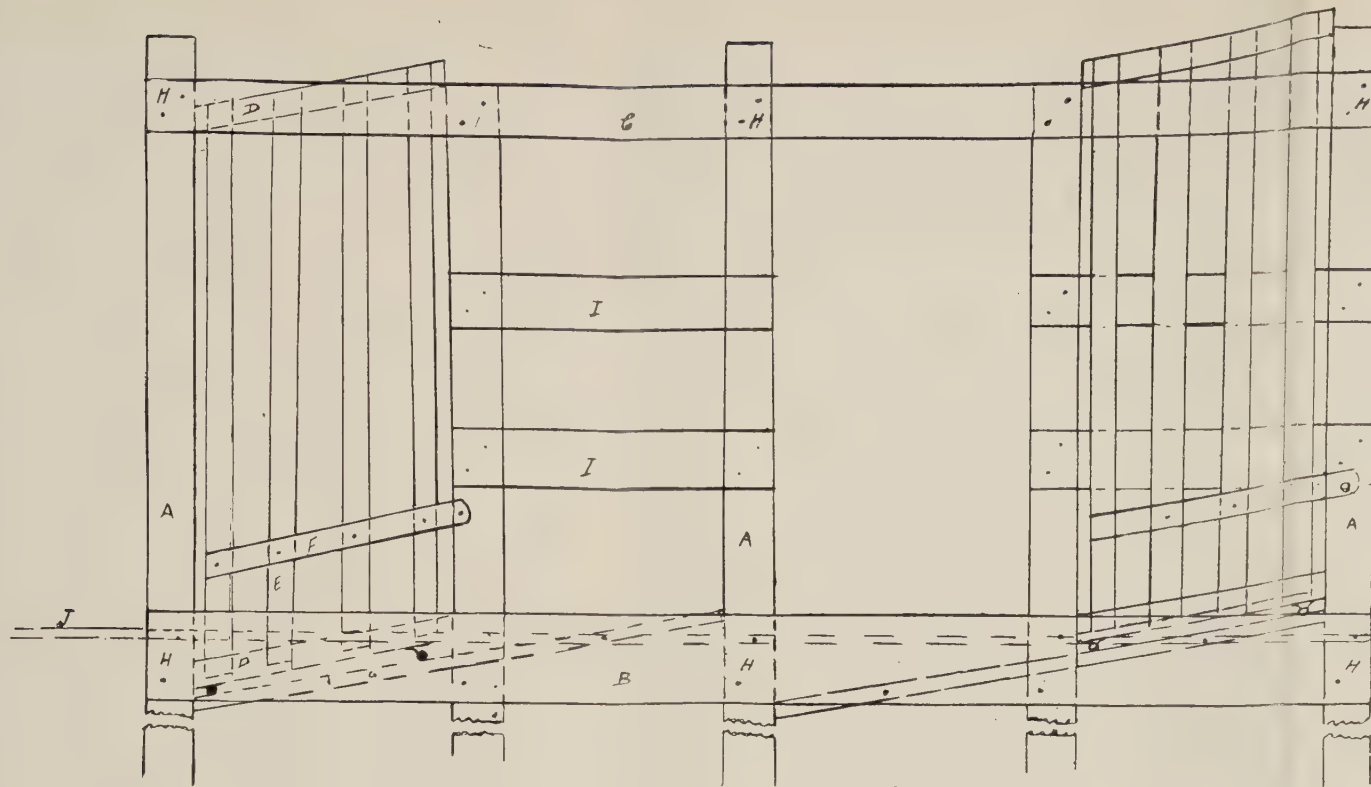
Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Peewee ...	Holstein-Sh'rth'rn	20 May, 1908	1,044	3·6	42·09	
2	Grace ...	Shorthorn	30 May "	1,000	3·4	38·04	
3	Sue ...	Grade Shorthorn	25 May "	930	3·4	35·41	
4	Lady Loch...	Ayrshire	20 June "	633	3·8	26·93	First calf
5	Hetty ...	Ayrshire-Sh'rth'n	25 Mar. "	443	5·0	25·81	
6	Lark ...	Ayrshire	6 June "	554	4·0	24·81	First calf
7	Nettle ...	Shorthorn	14 May "	622	3·4	23·68	
8	Carrie ...	Jersey	25 Mar., 1907	566	3·6	22·82	
9	Lubra ...	Grade Jersey	5 June, 1908	561	3·6	22·61	First calf
10	Damsel ...	Holstein	19 Feb. "	434	4·4	21·38	
11	Honeycomb	Shorthorn	23 Aug., 1907	275	6·4	19·71	
12	Mona ...	Holstein-Sh'rth'n	20 Oct. "	423	4·0	18·95	
13	Madge ...	Grade Holstein	16 June, 1908	478	3·4	18·20	
14	Rhoda ...	Shorthorn	27 Mar. "	449	3·6	18·10	
15	Nancy ...	"	7 May "	526	3·0	17·67	First calf
16	Glen ...	"	10 Feb. "	357	4·4	17·59	
17	Nellie II. ...	"	25 Dec. "	424	3·5	16·62	
18	Lily ...	Ayrshire	2 May "	499	2·8	15·65	
19	Cocoa ...	Jersey	20 Nov., 1907	325	4·1	14·92	
20	No. 112 ...	Grade Jersey	19 April "	246	5·4	14·88	
21	Lucy II. ...	Shorthorn	1 May, 1908	371	3·5	14·54	
22	Graceful ...	"	25 Feb. "	260	4·8	13·98	
23	Maggie ...	Grade Holstein	11 May, 1907	289	4·2	13·59	
24	Beauty ...	Ayrshire	20 Dec. "	322	3·7	13·34	

BAIL AND GATE FOR MILKING-SHED.

Last year we illustrated and described a handy bail and gate for milking-sheds, which was designed, constructed, and worked by Mr. David Alcorn, of Springbank, Mutdapilly. During show week a gentleman from Maryborough—Mr. C. H. Clayton—informed us that he had built his bails in accordance with Mr. Alcorn's directions. He says it is the most perfect system he ever tried. There is not the slightest trouble with the cows. As soon as they are milked, instead of having to turn round or back out, they simply walk through the bail and get at once to their own yard. We have been asked to reprint the article and diagram for the benefit of other dairymen.

The advantages claimed for these appliances are:—

1. A child can operate them in perfect safety from the rear.
2. A saving in time—no backing up or turning round—the cow walks straight through the bail, which draws back both at the top and bottom; simultaneously the gate moves back an equal distance. Two steps, and the cow is in the grass paddock.
3. The gate and bail-stick adjust themselves for the next customer—the gate, by running back into its place in front of the bail; and the bottom end of bail-stick flying back to its place when the hand of the operator is removed.
4. Crowding milked and unmilked cows together is thus entirely obviated, and the risk of ripping, tearing, and swearing is non-existent.
5. The bail and gate are easily constructed by any handy man.



IMPROVED COW-BAIL AND GATE.

SPECIFICATIONS OF BAIL AND GATE AS PER ATTACHED TRACING.

Bail.—This is shown on the tracing in three sections—1, 2, and 3. Section 1 shows the bail open to receive the cow. Section 2 shows the bail closed, and how it is held in that position. Section 3 shows the bail open at both top and bottom, to allow the cow to go out.

Construction.—The whole is constructed of hardwood timber, bolted together, as shown on the plan.

Posts.—A represents the posts on which the bail is built, and may be either round or sawn timber. If sawn, the corners next the cow's neck should be rounded, and may be of any size considered substantial enough for the purpose. These will be sunk into the ground about 2 feet, standing 6 feet 6 inches out of the ground, and 6 feet wide apart from centre to centre. The posts to be bolted to the rail that divides one bail from the other.

Planks.—Hardwood planks, 10 inches by 1 inch, marked B on the plan, are let into the posts already mentioned, leaving a space of $2\frac{1}{4}$ inches between, and securely bolted level with ground, as shown.

C.—Hardwood planks, 6 inches by 1 inch, let into both sides of the posts 6 inches from the top, leaving a space of $2\frac{1}{4}$ inches as in the case of the bottom planks, and bolted.

Posts.—A 3-inch by 3-inch hardwood post (D) is fixed 3 feet from the bail post, between the top and bottom planks, and bolted as shown. This post has a long mortice to allow the bail catch to move upwards easily; the top end is shaped as shown.

Bail-stick.—The bail-stick (E) is of hardwood, 3 inches by 2 inches, 6 feet 3 inches long, having a long-shaped mortice near the centre, about 2 inches deep, to receive the end of the bail-catch. The bottom end to be cut on an angle, and fitted with a small wheel.

Bail-catch.—A hardwood batten (F), 3 inches by $\frac{3}{4}$ -inch, is fixed to the bail-stick with a bolt, leaving sufficient room to work easily. The other end to have a notch near the end to catch in post (D) at the mortice, holding the bail-stick securely in place.

Inclined Bottom.—A piece of hardwood (G), $2\frac{1}{4}$ inches by 2 inches, is fixed between the bottom planks extending from the block marked H to the bottom of the post marked D, with a fall from right to left of 6 inches. This piece will form an inclined bottom to the $2\frac{1}{4}$ -inch space above mentioned between the planks, and bolted through as shown.

Blocks.—H represents blocks of hardwood, $2\frac{1}{4}$ inches thick, 6 inches wide, and 10 inches long for the bottom, and 6 inches long for the top, put in position between the planks and bolted. The block at the bottom is meant for the bottom end of the bail-stick to bump on, and the upper one to prevent the bail-stick closing too tightly on the cow's neck.

Concrete Line.—I represents the concrete line, $2\frac{1}{2}$ inches from the upper edge of the bottom planks.

Gate.—This is shown in two sections—section 1 shows the gate closed, and section 2 shows it open.

Posts.—A represents the posts forming the side of the yard or shed, sunk in the ground to a sufficient depth to suit the purpose, and standing out at least 6 feet 6 inches. The insides, or bail sides, of these posts are faced so as to give an even line on which to fix the planks. The main posts will be put in 6 feet apart from centre to centre. Another post, also faced, is put in 2 feet 6 inches away from the post on the left, and just as high as the top edge of the top planks.

Planks.—B represents hardwood planks, 10 inches by 1 inch, fixed as follows:—The first plank is placed in position along the faced posts at the ground, and well spiked or bolted thereto. Then block H, being $2\frac{1}{4}$ inches

thick, 10 inches long, and as wide as the post the other way, is spiked to the planks already fixed; then the second plank is put in position and spiked or bolted. This will leave a space of $2\frac{1}{4}$ inches in which the gate will run.

Top Planks.—The top planks (C) are put on 6 inches from the top of the main post in every particular as the bottom ones. The first planks put on, both at bottom and top, are spiked at the centre post; heads of spikes or bolts to be countersunk, so that the gate may work between the planks with freedom.

D represents the bottom and top rails of the gate, and is of hardwood, 3 inches by 2 inches, morticed as shown for 4 3-inch by 1-inch bars. These mortices to be made on an angle, so that when the gate is in position the bars will be plumb.

E represents bars of the gate pegged top and bottom, the bottom rail to be supplied with two small wheels, about 2 inches in diameter, held in position by iron fasteners countersunk.

F is a 3-inch by 1-inch piece bolted to the bars of the gate on the inside.

A piece of hardwood (G), $2\frac{1}{4}$ inches by 2 inches, is fixed in space between planks and bolted as shown, with a fall from right to left of 10 inches; this forms an inclined bottom on which the gate runs.

H.—Blocks put in where shown on plan, and already described when fixing planks.

I.—Two rails fixed to inside of centre on right-hand posts to close this space; these are of 6-inch by 1-inch hardwood, spiked on.

J.—Line of concrete, $2\frac{1}{2}$ inches from the upper edge of the plank.

K.—The distance between the gate and the bail will be 20 inches, to allow room for the cow's head.

All posts and rails dividing one bail from the other may be made of round timber.

[Mr. Clayton said that the total cash outlay on his bails amounted to 18s. for timber and 5s. for bolts.]

RESULTS OF MILKING COMPETITIONS AT THE NATIONAL ASSOCIATION'S EXHIBITION.

National Champion Butter Fat Test, special prize of £25, presented by the Brisbane Newspaper Company, to be won three times by the same exhibitor, cow (any breed) giving the best butter fat results in forty-eight hours under the Babcock test, and which has been the property of the exhibitor three months before the date of entry. (Mr. E. Burton's Stumpy secured the first "leg in" last year.)—P. Biddles' Mary II.

Cow yielding the largest quantity of butter fat in forty-eight hours (Babcock tester). The test milkings took place at 7 a.m. and 5 p.m. on Wednesday and Thursday, 12th and 13th August, the date of calving being taken into consideration. First prize, £5; second, £3; third, £1 10s. (£2 2s. was presented by E. Sachs and Co.). P. Biddles' Mary II., calved 15th April, 1908; milk, 77 lb. 12 oz.; butter test, 3·898; commercial butter, 4·317; points for age, 69; lactation, $15\frac{1}{2}$; total, $84\frac{1}{2}$. W. F. Hammel's Trilby, calved 9th February, 1908; milk, 95 lb. 11 oz.; butter test, 3·378; commercial butter, 3·684; points for age, 59; lactation, 24; total, 83·2. S. Holmes's Florrie, calved 12th July, 1908; milk, 117 lb. 7 oz.; butter test, 3·855; commercial butter, 4·173; points for age, 66; lactation, nil; total, 66·3. E. Burton's Stumpy, 63 $\frac{3}{4}$ points, 4; E. Burton's Silver Belle, 53, 5; E. Burton's Lady Kirkham and Pussy's Pride, each 52·6.

Special prize of £2 2s., presented by Messrs. Elliott Bros., Limited.—P. Biddles' Mary II. •

Special prize of £5 5s., presented by the proprietors of "Sydney Mail," for the best milch cow, any breed, subject to a test, and yielding the largest quantity of commercial butter in forty-eight hours.—P. Biddles' Mary II.

Special prize, £3 3s., presented by the Silverwood Dairy Factory Company, Limited, Brisbane, for the cow (any breed) yielding the largest amount of butter fat in four milkings.—P. Biddles' Mary II.

Cow yielding largest supply of milk in forty-eight hours, subject to result from Babcock tester, of not less than 3 per cent. of butter fat. The test milkings took place at 7 a.m. and 5 p.m. on Wednesday and Thursday, 12th and 13th August. First prize, £5; second, £3; third, £1 10s., of which £5 5s. was presented by the Nestle's and Anglo-Swiss Condensed Milk Company, Cressbrook, and £2 2s. by Mr. R. Tudor.—S. Holmes' Florrie, 117 lb. 7 oz., 1; W. F. Hammel's Trilby, 95 lb. 11 oz., 2; P. Biddles' Mary II., 77 lb. 12 oz., 3.

Special prize, £2 2s., presented by Mr. Peter Comino, conditions same as preceding class.—S. Holmes' Florrie.

TABLE OF RESULTS.

The following are the details of the tests as supplied by Mr. R. W. Winks (Government Dairy Expert):—

WEDNESDAY'S MILKING.

Name of Cow.				Lb. of Milk.	Test.	Butter Fat.	Lb. Commercial Butter.
MORNING.	Pussy's Pride	...	...	15.5	3.3	.505	.548
	Mary II.	...	...	17.14	4.3	.768	.851
	Florrie	...	...	27.5	3.	.819	.883
	Trilby	...	...	24.14	3.6	.895	.980
	Lady Kirkham	...	...	17.8	3.6	.630	.689
	Silver Belle	...	...	20.2	3.2	.644	.698
	Stumpy	...	...	20.15	3.1	.649	.702
EVENING.	Pussy's Pride	...	...	16.10	4.1	.681	.748
	Mary II.	...	...	16.8	4.	.660	.736
	Florrie	...	...	29.14	3.2	.956	1.03
	Trilby	...	...	2.31	3.4	.784	.853
	Lady Kirkham	...	...	14.5	4.8	.687	.765
	Silver Belle	...	...	18.12	4.	.750	.826
	Stumpy	...	...	20.10	4.8	.990	1.10

THURSDAY'S MILKING.

MORNING.	Pussy's Pride	...	...	13lb. 15oz.	3.4	.469	.511
	Mary II.	...	...	20.11	4.1	1.25	1.38
	Florrie	...	...	29.11	3.2	9.50	1.03
	Trilby	...	...	23.6	3.2	.748	.811
	Lady Kirkham	...	...	13.14	4.3	.596	.660
	Silver Belle	...	...	18.13	4.1	.771	.852
	Stumpy	...	...	19.3	4.	.767	.846
EVENING.	Pussy's Pride	...	...	13.5	3.7	.492	.539
	Mary II.	...	...	22.11	5.4	1.22	1.36
	Florrie	...	...	30.9	3.7	1.13	1.23
	Trilby	...	...	24.6	3.9	.951	1.04
	Lady Kirkham	...	...	13.14	4.2	.582	.643
	Silver Belle	...	...	18.3	4.7	.854	.951
	Stumpy	...	...	16.7	3.6	.591	.647

WEIGHTS OF THE COWS.

The cows were weighed by Mr. E. A. Pickering on Monday for record purposes. The weights were as follow :—Florrie, 10 cwt. 2 qr. ; Stumpy, 8 cwt. 3 qr. ; Silver Bell, 7 cwt. 3 qr. 7 lb. ; Lady Kirkham, 7 cwt. 2 qr. 14 lb. ; Pussy's Pride, 6 cwt. 1 qr. 21 lb. ; Trilby, 9 cwt. 1 qr. 21 lb. ; Ruby, 7 cwt. 3 qr. 14 lb.

ANGORA GOATS.

As the interest in the mohair industry appears to be increasing in Queensland, we revert once more to the subject, although actually since December, 1899, no less than forty-four articles on the subject have appeared in this Journal. For the benefit of new settlers, however, we again consider the industry.

To begin with, we believe that there are no absolutely pure Angoras (females) in the country. At one time, pure Angoras could be imported from Turkey, but since 1881 the export of Angoras from that country has been forbidden, although, as a matter of fact, a few piastres judiciously bestowed have in some instances unlocked the door to American buyers. Be that as it may, the Angora in Queensland is the result of crossing and recrossing until the real type of Angora has eventuated.

STARTING A FLOCK.

In building up a grade flock, the males must not be allowed to grow into bucks of breeding age, and in no case should any but a thoroughbred sire be used. These, it is stated, can be got from £5 5s. to £15 15s. each. If a few purebred does can be purchased at the same time to mate with this buck, some good young bucks can be obtained to put to work later on. A remarkable feature about the thoroughbred Angora bucks is the rapidity with which they impart their distinguishing qualities to their progeny. It takes three or four crosses, commencing with common does, to produce a grade animal which can barely be distinguished from the thoroughbred at a short distance, and which produces a mohair fleece weighing from 3 lb. to 5 lb. of a good average quality.

The common does should be entirely white, any other colour is objectionable. Other desirable qualities are small head, short, smooth hair, and small horns. Objectionable features are long, coarse hair on the thighs and fore legs below the shoulders. The common does are very prolific, and can be obtained at a moderate figure. Always pick does with the shortest and finest hair. The short hair in mohair is known as "kemp," and the shorter you can get it the more valuable will be your clip. The buck should be as free from "kemp" as possible, so when selecting handle him carefully and look for the short, thick hairs that lie close to the skin; the less he has of them the better. Does crossed with a good buck will produce first grade, from which the best does can be selected, and so with careful management a flock of high quality can be built up. The young grade bucks should be converted into mutton. They make the best of mutton, and their skins are valuable for mats or rugs until the flock has been so bred up that it will pay to clip.

As to the age for breeding: Goats reach maturity when about sixteen or eighteen months old. If bred earlier, the kids will be undersized and partially developed.

Kids should not be weaned until they are four and a-half months old, when they are very strong, but should not remain with their dams after they are five months old. Buck kids not reserved for breeding purposes should be castrated when about two weeks old.

The kidding time is the most important time in the life of goats. For two or three days after the kids are dropped they are exceedingly delicate. They cannot rough it at this period, but will die from any little exposure and neglect. They are more delicate for a few weeks than lambs, but when large enough to follow the flock their constitutions are stronger, and they are well able to look after themselves. It is useless trying to rear Angoras unless you provide a small paddock for kidding and keep the bucks and wethers out, and leave them as undisturbed as possible. The Americans go so far as to yard them at kidding time. As for climate, no place has been found that is too hot or too cold for Angoras. Though not partial to heat, they will stand it quite as long as sheep. Shade is essential to success if the sunshine is very hot. In considering

Angora culture it is of more importance to study the climate with reference to moisture than temperature. Therefore, low lands with much moisture are not recommended. As a drought-resister the Angora has in Australia completely eclipsed the merinos, and also beats them easily in the matter of yield and in scouring tests. A fair average yield for greasy merino fleeces is 45 per cent., while similarly for greasy Angora fleece 65 per cent. is a fair average yield. In America there are about 300,000 Angoras, and the industry is a very thriving one. Cape Colony, in 1900, had 4,000,000 Angoras, and exported £450,000 worth of mohair. There can be no reason why Angoras should not do equally as well in Queensland.

GOATS AS LAND CLEANERS.

As land cleaners goats have no equal. They are constantly at work, and it is wonderful how they will convert dense undergrowth into rich grazing land. We have any quantity of suitable land in the State that would benefit by being cleaned up by flocks of goats, and at the same time the owner would not only have his country improved but would have a clip of mohair and good mutton as well. So far, little in this way has been done out here, but in the United States they have done wonderfully good work. One writer says:—"The work they have done is beyond my expectations, and what has been said about their efficiency as brush or land cleaners that I have read or heard of has not been withdrawn." Another writer says that "in the Hawaiian Islands they are being used to eradicate the lantana"; if they are successful in keeping down this pest, our farmers on the North Coast line should try to experiment, and I have no doubt a great amount of good would result.

CARE AND MANAGEMENT.

As with all domestic animals, to get best results they require good care. Generally speaking, they are hardy, and thrive well as far north as Alaska, and in the extreme heat of Guadalupe Island, so there is no reason why they should not do exceptionally well here, so long as the owner uses ordinary common sense in managing them. They will breed at five and six months old, but it is far better to allow them to come to maturity, and not to breed from them until they are twelve or fourteen months old. They are in their prime from two to nine years, and have been known to breed up to fifteen years. Old goats produce mohair of a coarser quality, which consequently is of less value than younger goats. The age is determined the same as sheep.

NOT LIABLE TO DISEASE.

Goats are less subject to disease than other animals, but when you notice a weak one in the flock be careful to isolate it for a few weeks until it regains its strength. The stronger goats are given to bunting the weaker, and they get down and are trampled to death.

BREEDING.

It is generally agreed that in-and-in breeding produces the finest quality of mohair, having all the beautiful lustre and little oil, but then you must bear in mind you are reducing the size and constitution of the animals. The period of gestation in goats is 150 days, and care should be taken to mate them so that the kids are dropped in the warm months, as they are delicate for the first few days. It is not an uncommon thing for does to produce twins, but the higher the standard of your goats the less twins are produced. The average percentage of kids in large flocks is about 70 per cent., but with small flocks and care you should have 95 per cent. to 100 per cent. At kidding time the does should be kept at home and in small areas, as they are given to roaming in the larger areas, and lose their kids. Goats require plenty of fresh air, so it is unwise to crowd them in small yards with shelter-sheds that do not give them plenty of room. Good fleeced goats require dry sheds rather than warm ones. In close quarters they are given to bunting, but do little harm.

SHEARING.

Shearing should not be delayed until the goats begin to shed, as the mohair loses its lustre, the skin itches, and every effort is made to get rid of the fleece. You can use your own judgment about shearing twice a year. It is allowed you get a little more in weight, but as against that your length of mohair is less, and the price falls accordingly. Shearing machines are the best to use, and goat-owners find it to their advantage to use them. The fleeces should be kept as clean as possible, carefully rolled and never tied with string, as manufacturers complain sorely about this practice. Dalgety and Co., Sydney or Brisbane, will be pleased to handle what mohair you have got for sale.

MOHAIR.

Mohair is the technical name for the fleece of the Angora goat; it is a hair pure and simple, and differs from wool, as it has not the felting properties of that product. The fleece of a good Angora goat should be pure white and exceeding lustrous, attain an average length of 8 to 10 inches, and should hang in wavy curls or ringlets from all parts of the body. It is a fact known to practical breeders that goats have two coats of hair; the outer and more abundant is the mohair, and the under coat a coarse, chalky white, straight, stiff hair, which varies from $\frac{1}{2}$ -inch to 4 inches. This under hair is known as kemp, and is believed to be a relic of the common goat blood, and, as pointed out previously, this is what all breeders should try and breed out as much as possible. It reduces the value of your mohair, and is objectionable to the manufacturer; and why? Simply because it will not take the dyes used for mohair; the only effect of the dye is slightly to discolour the kemp. There are dyes which act upon kemp, but they have no effect on the mohair, and no dye up to the present has been found to act satisfactorily upon both. There is a use for kemp and short mohair, as I have before stated. It is used principally in the manufacture of a cheaper class of goods, and fillings for carpets, &c.

RECORD PRICE.

The record price for Australian mohair is 4s. 2d. per lb. This price was lately realised by Blaxland and Knox, of New South Wales, for a fleece from their imported buck Perfection. The fleece, weighing 9 lb. 8 oz., and the skirted portion 6 lb., was forwarded to a New York merchant, who paid 1 dollar (4s. 2d.) per lb., leaving a net return of £1 0s. 2d.

THE DEMAND FOR MOHAIR.

The demand for mohair is good, and there is every probability of an increasing demand, as new uses may be developed. "The American Wool and Cotton Reporter" states that with an increased production of Angora goats in this country, and the consequently enlarged introduction of mohair, the latter is going to be consumed more largely than heretofore, and is, indeed, already "cutting more of a figure in the wool market."

The great beauty of mohair is the lustre, which remains in the manufactured article, and no amount of washing or dye will remove it; in fact, it aids the dyes to show their colours more effectively, and, however much exposed, they will not fade.

Angoras in some countries are shorn twice a year; the yield, of course, as with sheep, depends on the quality of goats you are grading up. I should think shearing once a year sufficient in this State; it is all a matter of management on the part of the producer. If his goats are good and showing 8 to 9 inches of hair, it might be preferable to clip twice in the year, so as to prevent the hair matting.

ANGORA MUTTON.

It may seem strange to many in a country like this, where sheep are so plentiful, that this point should be touched on, but during my visit to Townsville show last year I saw as fine a lot of grade Angora lambs, bred by Mr. J. R. Chisholm, as anyone would wish to see. He exhibited them alive, and had a number of them killed, dressed, and hung up amongst a number of crossbred lambs. I venture to say 99 out of every 100 persons who saw them could not pick out the Angoras. They dressed beautifully, and were sold to a leading butcher, who supplied them to some of the best people in the city, and I guarantee they never tasted anything better. He also told me that he bought them regularly at 12s. 6d. each, and there was a good market for them. Of course, goat meat is always associated with prejudice of the common "ill-smelling Billy," but anyone who knows anything about Angoras will tell you they are free from goat odour, and their meat is totally different from that of the common garden variety of goat; it is finer, carries more fat, is smaller in the bone, and more like merino lamb than anything else. In parts where sheep will not thrive, no man need be without good mutton if he keeps a few Angoras. The does are not equal as milkers to the common goat, but many good milkers are to be seen in various flocks; their milk is very rich, and many writers state that it is more nearly equivalent to human milk than that of any other animal. It is an old saying but a true one, "that a goat will thrive where a sheep will starve," and, further, goats are thriving in districts where cattle are dying of redwater and ticks, and it is a rare thing to find a cattle tick on them.

JUDGING BREEDS OF CATTLE.

At the last Maryborough show considerable surprise was evinced at the action of the judge, Mr. James Stewart, in refusing to judge the class entered as "Durhams" as such. The point on which Mr. Stewart based his decision was that the Durham is an ox, and essentially a beef breed, and that those exhibited were Illawarra Milking Shorthorns, and a very excellent type of the class. Still, they were crossbreeds of the Ayrshire and Durham, and, therefore, could not possibly come under the classification of pure Durhams. It is held, and rightly so, to be a mistaken idea that Milking Shorthorns are Durhams, and Mr. Stewart and other judges are of opinion that the sooner this delusion is expunged from the minds of the people the better it will be for all concerned. In any future judging, unless the pure Durham is exhibited, he will never pass crossbreeds for the former, although this has been done on several occasions. When this matter was discussed between the stewards and exhibitors at the show, both parties, we are told, unanimously agreed with Mr. Stewart's proposition, and the judging proceeded on the above lines. This decision will doubtless be of interest to show committees and cattle breeders.

The Shorthorn sprang from the Teeswater, true, but the old Teeswater was more a dairy cow than the latter-day Shorthorn, the reason being that our ancestors of those days were improvident, never fed their cattle or cared for them, requiring nothing but the milk, and hence they did not develop into beef-producers. On this matter of descent it may be mentioned that the old Durham or Teeswater cattle were known in England from the earliest historical period as beef cattle, although, as stated, neglect and improvidence resulted in the beef type not becoming so pronounced as subsequently under better conditions. The Shorthorn is a descendant of the breed, and for many generations has established certain characteristics which attracted the attention of the most noted breeders, such as Bates, Booth, and Cruickshank, who became celebrated for the excellence of their animals, and it may safely be said that to-day the Shorthorn stands pre-eminent for its beef-producing qualities throughout the civilised world.

Last year Mr. Stewart attended the Royal Show at Lincoln, England, and noted that Shorthorns were sold at very high prices. One bull brought 1,000 guineas at public auction. He was, however, much disappointed at the English and Scotch so-called Milking Shorthorns, as they seemed more like bullocks than dairy cattle, and altogether lacked the propensities of deep milkers, and it also struck him that their term of lactation would be a short one. After visiting a great many herds in England and Scotland, he was most impressed with the Lincoln Red Shorthorn as a dairy animal, and consequently purchased several for breeders in this State. These animals, we understand, are giving entire satisfaction to their owners.

THE MILK TRADE—QUALITY OF MILK.

So many vendors of milk have been lately fined in this State, owing to the alleged—and, in most cases, clearly proved—adulteration of the milk by added water, that anything which may tend to exonerate innocent dairy farmers from the charge cannot fail to be of great interest, and especially so any evidence which would tend to show that the time of year and the feed have considerable effect in reducing the percentage of butter fat. A writer in the British "Live Stock Journal" says:—

The subject of milk contracts is one which needs the serious consideration of the dairy farmer, for the tying nature of many which are constructed by milk buyers is very great, and it is almost impossible for the producer to carry them out to the letter.

The chief clause is that as to quality; and whilst most milk buyers are content to accept milk "guaranteed pure, with all its cream," numbers specify the percentage of fat that it must contain, or below which richness it must not fall. In many instances the figure is unduly high, and in one case coming under notice of the writer the milk had to contain not less than 3·75 per cent. of fat, an altogether excessive percentage, and one which it is doubtful if any farmer could keep up to unless having Jersey, Guernsey, or other special breed of cows noted for the richness of their milk.

The more common requirement is 3·25 per cent., but even this quality is frequently not attained by the majority of milk producers at certain periods of the year.

Now, whilst the purchaser stipulates that this quality must be reached, if not exceeded, a proviso is made that, if it falls below the figure specified, a deduction of $\frac{1}{4}$ d., $\frac{1}{2}$ d., or some other amount per gallon shall be made.

From considerable experience in testing milk from mixed herds and individual cows, the writer is assured of the difficulties, feed in what manner you will, of producing milk even up to the Government's standard—viz., 3 per cent. of fat—at certain periods of the year. Taking the different months of the year, April is undoubtedly the one in which the poorest milk is produced, and the mixed milk from numberless farms tests down so low as 2·6, 2·7, 2·8, 2·9, and 3 per cent. of fat only, though it generally meets the Government requirements as far as solids non-fat are concerned, which are 8·5 per cent.

It is about the end of March, April, and early part of May that such numerous prosecutions take place for adulterated milk, and, unfortunately, where the letter of the law is enforced a great number of innocent persons are convicted and fined for adulteration, the magistrate being ignorant of cows and of their peculiar capacity of yielding milk below the fixed standard of quality.

The effect of food in improving the richness of milk is, unfortunately, very slight, and, whilst something can be done in the case of a herd yielding poor milk, it is but little.

Provided a cow is well fed—that is, getting all the food necessary for the support of her body and for the manufacturing of the particular quantity of milk she is giving—extra food then has little or no effect in improving quality. It is a cow in poor condition, which is badly fed, that will respond to good feeding, and in such cases an improvement in the quality of milk is obtained.

Again, a change of food helps to improve the quality a little; as just in the same way human beings get tired of one particular diet served every day, so a cow served with fresh food yields a rather better milk, but the change is, as a rule, only temporary.

Poor milk is largely due to the cow itself—"breed," as it is usually designated—and whilst there are many cows in the herd always yielding poor milk, there are others yielding rich, so that when all is mixed together a fair average test is obtained. It is at times of maximum flow, spring season of the year and other climatic influences, that the poor quality of mixed milk is most noted.

Thus it is wise for farmers to be cautious in signing contracts to avoid as much as possible harsh restrictions which milk buyers would have the power to enforce.

A give-and-take policy is necessary, for, whilst milk is very poor at certain times of the year, on the other hand it is very rich in autumn, when the cows are not yielding so much. Further, no farmer should be responsible for milk after it has been delivered into the hands of the dairyman. For samples taken on the milk round, the vendor should be wholly responsible.

ANGORA FLOCKS IN QUEENSLAND.

The following gentlemen own considerable numbers of Angoras in this State:—

Messrs. H. Missing, Tiaro, near Maryborough; H. Philp, Grantham; G. H. Simpson, Torrington, Toowoomba; J. M. Doherty, Gayndah; J. R. Chisholm, the Prairie, North Queensland. Besides these, there are several owners of from half a dozen Angoras and upwards.

In South Australia the most notable breeder is Mr. E. A. Scammell; in New South Wales, Mr. R. Blaxland; in Western Australia, Mr. J. D. Rankin; the latter gentleman last year obtained 3s. per lb. for his mohair, clear of all expenses. He reckons 15 lb. mohair to be a fair annual clip from one goat.

PRICKLY PEAR AND RABBITS.

Killing two birds with one stone is profitable, and Mr. Herbert Paul, the inventor of the pneumatic cane-cutting implement, has suggested to us a plan by which the pear could be eradicated and a good trade be done in rabbits. His idea is not to fence the rabbits *out*, but to fence them in. In prickly pear country, where there are numerous rabbits, enclose a large area with a rabbit-proof fence. When all other means of subsistence have vanished, the rabbits would be compelled to live on the pear, and when that has been destroyed thousands of rabbits could be obtained for export. It is a good idea, but we do not recollect seeing rabbits in country densely covered with the pear.

The Horse.

SPEED AND STAMINA OF THE WELSH PONY.

The recent importation by Mr. John Mahon, Principal of the Queensland Agricultural College, of the Welsh pony sire Ich dien, will give an interest to the following notes on these ponies by Mr. J. Jones, of Dinarth Hall Pony Stud, Colwyn Bay. Writing to the "Live Stock Journal," Mr. Jones says:—

We have read with interest the various articles in your recent issues, and noted the varying statements and comparisons as to the stamina of the Hackney and the American harness horse, but it is questionable whether for endurance and stamina either can vie with the Welsh cob or pony. The stamina and endurance of the Welsh cob and pony are proverbial to those who have had experience of them, and, even when mingled with alien blood, their Welsh characteristics are outstanding.

We have in our possession to-day a pony mare, well known in Wales as Nance or Glyn, standing 13 h. 1½ in., foaled in 1891. She was bred by the late Mr. Jenkin Jenkins, of Blaenplwyf, Cardiganshire, and we purchased her from his executors. Her dam and all her ancestors were pure Welsh, but her sire was the thoroughbred Rameses. This pony commenced her racing career as a two-year-old. She has never received any orthodox training, for the whole of her life she has wintered out—not in the fashionable paddock, with its accompanying expensive forage, but on the highest peaks—in all weathers, and with only Nature's own feeding. She has often raced direct off the field, and on many occasions won three races in an afternoon, these varying from 1½ to 3 miles each. Her category includes flat-racing and steeple-chasing over the roughest of country, and more than often competing without any limit of height. Her opponents have included clean thoroughbreds, hunters, and a fair average of the ordinary race-meeting animal.

From 1893 to 1903 Nance or Glyn competed in 268 races, winning 184 firsts, 60 seconds, 16 thirds, and only eight times unplaced. Since then her record has not been so minutely kept, still she has won a very large proportion of the races in which she has started, her latest achievement being on 6th May, this year, when seventeen years old, and only one week off grass, she won two races of 2 miles each. Both events came within half an hour of each other. Her opponents included, we believe, three of the fastest Galloways in Wales.

We think we can safely throw down the gauntlet to any breed to produce an animal whose achievements are so marked and extend over such a period, and who is to-day (at seventeen years old) probably fit to hold her own with at least any pony of her own size on flat or cross-country over a distance of 3 miles or upwards.

NOVEL METHOD OF TEACHING A HORSE TO TROT.

Crabstick, a son of the mare One Eye, by a son of Messenger out of a daughter of Messenger, was such a confirmed pacer and so ill-tempered that his owner despaired of teaching him to trot. A Mr. Ebenezer Pray, of New York, succeeded, after a long struggle and many falls, in making him renounce the "one side at a time" gait. He planted on the side of the road rails and stakes at intervals of a good trotting stride, and tried to make Crabstick trot over them. The horse began by throwing Mr. Pray, but he remounted, and at length managed to get Crabstick to face this novel course. After he had gone over it once or twice, the interval between the rails was increased, and then the horse was put over them again and again until both he and his rider were exhausted. Wilful and hard to manage as he was, Crabstick would always trot afterwards when required to do so.

Horticulture

FLOWER GARDENING, No. 8.

By THE EDITOR.

PLANTS SUITABLE FOR OUTDOOR CULTURE.

LILIES.

Lilies, as a rule, do not figure largely in suburban gardens, yet most of them will grow in almost any ordinary garden soil; a good, rich, loamy will suit them, but some prefer a soil of loose sandy texture, as, for instance, the beautiful *Lilium auratum*. The Golden Lily of Japan thrives best in a soil composed of equal parts of loam and peat, with sand added.

A point to bear in mind in cultivating lilies is to disturb them as little as possible; it is sufficient to add a top-dressing of soil annually. If it be absolutely necessary to transplant any, care should be taken that this be done at the proper season, as soon as the stems have died down. The ground for lilies should be trenched of 2 feet, and be well manured; plant the bulbs 6 inches deep and 6 inches apart, leaving more space for the larger kinds, and water freely during the growing season. The best months to plant lilies are from March to June. Animal manure should not be dug in with the bulbs, and, if used, it ought to be completely decayed and placed at some distance from the bulbs. Lilies may be allowed to remain in the same spot for years, but, if it is found necessary to lift them, they should be immediately replanted, as the roots are continually in motion, and quickly make a new growth.

When planting in beds, the most effective way is to plant them in groups of three to nine bulbs in a mass. The plants must not be exposed to a hot sun, and, therefore, require to be shaded by some means. Dry hot soil will impoverish the bulbs and prevent increase, and to benefit these it is necessary to cover the beds with a thin covering of straw litter or peat fibre.

Of two species of more modern introduction, *Lilium auratum* is the most magnificent. This is the Golden-rayed Lily of Japan. The elegant Chinese Trumpet Lily makes a valuable spring and winter decorative plant, as it has immense flowers of snow-like purity.

A STORY OF CHINESE LILIES.

The "Californian Cultivator" prints a curious legend of the origin of the species of narcissus known as Chinese lily; it is as follows:—

Very few people who see and admire the beautiful Chinese lilies know the reason why this particular flower is held in such favour in the Orient. This is the story of the origin, as told by a Chinaman:—

Years and years ago a member of the celestial empire had two wives whom he loved dearly because each had borne him a son. While they were still lads the father died, and, in settling up the estate some difficulty was encountered, for the man left his heirs two pieces of land, one a strip lying in a fertile and beautiful valley, the other a small ribbon of land bordering the bed of a narrow stream. The former land was known to grow anything the country produced, while the latter was counted utterly worthless.

It was at first proposed that each of the two strips be divided in half, and a section of each be given to the two heirs. But the mothers could not agree upon the division, and it was finally arranged that one son should take the rich land, while the other should take the sterile piece.

The valley strip yielded bountiful harvests season after season, and the rocky one gave nothing until one day the boy owner happened to notice a tiny

white sweet-scented flower blooming among the rocks, and after a careful study and examination it was found to be the only one of its kind in China. The flower grew from a bulb, and the boy discovered that these bulbs could be transplanted to similar rock soil without destroying their growth.

Soon the bulbs were in great demand, and when it was learned that the flowers brought good luck to the owner of the plant the boy had all he could do to supply the market. From the sale of the bulbs he grew enormously wealthy, while his brother never made more than a good living out of his valuable valley property.

Many of the species thrive well in pots. As potting is a very important operation, I shall, later on, devote some space to the subject.

SOME GOOD VARIETIES.

Tigrinum (single and double Tiger Lily); *Speciosum (lancifolium) rubum*, white, spotted with crimson; *Speciosum (lancifolium) album*, pure white; *S. (l.) roseum*; *Longifolium Harrisii* (Bermuda Lily), pure white, with very large flowers.

Lilium auratum.—Of all the lily tribe this is the finest in size, sweetness, and colouring. The flowers are from 8 to 10 inches across, ivory-white, thickly studded with crimson spots, with a bright golden band through the centre of each petal.

Thunbergianum (a Japanese lily), dwarf in habit, with extremely showy handsome flowers. Valuable for pots or bedding. Japonica, the beautiful "Spider Plant," may be here included, as also *Sarniensis* (Guernsey Lily), which belongs to the *Amaryllis* tribe of bulbous plants. The Japonica sends up flower stalks 9 to 12 inches high, which are crowned with umbels of bright red flowers with long curved stamens.

Among the lilies must be mentioned the *Calla*, or *Richardia* (Lily of the Nile), and a dwarf variety of the same, *C. Little Gem*, which is very handsome and valuable for table decoration. *C. Ethiopia* (Arum Lily) has large foliage, beautiful white flowers, deliciously scented. It prefers a moist situation, and makes a fine pot plant.

A very handsome and peculiar flower is the *Calla sanctum* (Black Calla). The flowers are large, of a deep-purple colour, with black pistils standing well out of the flowers. The foliage also is very handsome and curious.

Agapanthus and Crinum: The *Crinum* resembles the *Agapanthus*, which is a strong tuberous plant, with a flower stem 3 feet in height, surrounded by a crown of beautiful blue and white flowers. The *Crinum* produces the same tall flower stems, but its flowers are more feathery. Both will thrive in any ordinary garden soil.

Lilies may be propagated by means of the scales of the bulbs, separated and planted in sand, but the safest way is by separating the small offsets or the bulblets that are produced in the axils of the leaves of some species.

ANEMONE.

These beautiful flowering tuberous plants (Wind Flowers) deserve a place in every garden. The foliage is very beautiful, the blooms last for a long time, and they rank amongst the garden plants which are easiest of cultivation. The Anemone requires a rich loamy soil, but care must be taken that no manure comes in contact with the tubers. If it does, they are certain to perish. The tubers should be planted in masses to produce the best effect. They must be lifted annually or bi-annually, as soon as the foliage has decayed, then dried and stored away until March, when they may be replanted. Seed sown in the spring and left in the ground will flower in the following spring. The tubers should not be planted deeper than 2 inches in heavy soil, or 3 inches in light. When planted in rows or in patches they should be set in rows from $1\frac{1}{2}$ to 2 feet apart, with from 9 to 12 inches between each plant. The same distance between each plant is advisable when planting in patches.

Anemones are reproduced by dividing the tubers and from seed, as the plant seeds freely. The seeds, being very woolly, require to be mixed with sand and rubbed, to separate them, then sown in light soil in boxes.

SOME GOOD ANEMONES.

A. coronia; *A. fulgens*; *A. stillata*. *A. pulsatilla* is a handsome species, flowering towards the end of spring. There are blue, red, lilac, and white varieties. *A. japonica*, rose-coloured double; Dutch, double and single; the Budi, an extremely beautiful single variety, pure white, flowers freely; *Fulgens*, the Scarlet Wind Flower, has rich, dazzling, scarlet flowers, and is of light elegant growth. This is a double-flowering variety of *Fulgens*.

IXIAS.

This is a genus bearing very beautiful flowers. Scarcely any species of bulbous plant exhibits such a variety of brilliant colours as the *Ixias*. They are of very easy cultivation, either in pots or in the open ground. They prefer a light, sandy, and well-drained soil, and may remain in the same situation for several years. The bulbs should be planted from 4 to 5 inches deep. Plant in August and September.

IRIS.

There are several sections of this beautiful family of bulbous and herbaceous plants. All are very hardy, and, as a rule, they flower freely. They will thrive in almost any soil with very little care. Some kinds require a dry warm situation, others love the margins of streams and ponds, and others, again, revel in swamps, and even in running water. Such as these require plenty of shade. The Iris is also very effective when grown in a rockery. The Flag Iris the best known and the most extensively grown in this State. The foliage of this variety is broad, and the flowers blue-white or purple. This is the Iris Germanica and its hybrids, all bulbous plants. The Japanese Iris, on the other hand, has a fibrous root, and produces tufts of foliage, 3 to 4 feet in height, when well grown, above which the large distinct flowers are borne during the summer. There is a greater range of colour in this than in any other section. It grows to perfection when planted beside a watercourse or in any very damp situation, but will also thrive fairly in ordinary borders if the soil is of a loamy nature. The colours of the English Iris are white and purple; those of the Spanish Iris are yellow, bronze, lilac, and white. The plant is propagated by division of the roots, which, in the bulbous section, should be planted at a depth of from 4 to 6 inches, and about 4 inches apart. They may be allowed to remain three or four years in the same situations.

VARIETIES.

Kaempferi, many varieties; Lusitanica; Persica; Pavonia (the Peacock Iris); Susiana; Xiphium (Spanish Iris); Xiphioides (English Iris); and many others in great variety, including some winter-flowering species.

SPARAXIS.

This is another of the Iris family, a genus of low-growing, large-flowered, Ixia-like plants, of gorgeous colours and rich markings. They are very hardy, and do well in beds and borders. They are also closely related to Ixia, Babiana, and Tritonia, and require similar treatment. The commonest species are grandiflora and tricolor, of which there are numerous varieties. *S. pulcherrima* is very different in habit and appearance from the others. Strictly, it belongs to the genus Dierama. Its leaves bear a resemblance to those of the Iris; the stems are long and slender, attaining a height of 6 feet when well grown. They rise in a gracefully arching manner, like the stems of a tall grass. The flowers are like bells, about 2 inches long, and droop prettily from the stem at intervals

of a few inches. The colour is rosy purple. It lasts for a considerable length of time in flower during the summer months. Plant in August and September.

TRITONIA.

This genus of the Iris family contains several species, and a large number of varieties of pretty flowering plants, resembling Sparaxis in habit and appearance, and requiring similar treatment.

WATSONIA.

Another member of the Iris family. Some of the species are very handsome. In habit they resemble the Gladiolus, but most of the species have tubular flowers. The treatment applicable to Sparaxis suits them.

AMARYLLIS.

These, if planted in April and up to August, make a fine display during the spring and summer months. They are unsurpassed in value as bulbous flowering plants. They may be grown to perfection either in pots or in the open soil. The most suitable soil is a rich sandy loam, further enriched with bonedust, leaf mould, or well-decayed manure. The bulbs may be planted either singly or in clumps of from three to five, and they may remain for some years, until the patch becomes over-crowded with offsets, when they should be divided. If grown in pots, they must be repotted annually; a 7-inch pot is sufficient for the largest size. No more water must be given to them during the winter, the soil being allowed to become quite dry. During the summer feed them with liquid manure.

Amaryllis belladonna is a distinct species, which flowers in autumn. The flowers are of a delicate pink colour.

Formossissima (Spreckelia) (Jacobæan Lily) is a deep crimson.

Purpurea (*Valotta purpurea*) has bright orange-scarlet flowers.

The Hippeastrum belongs to the Amaryllis family. Its flower stems are from 18 inches to 2 feet high, surmounted by remarkably handsome large heads of trumpet-shaped flowers of various shades of crimson, striped with white, and white grounds with crimson markings. They make charming border plants, and are of very easy culture. Old and New Varieties: There are about forty species of Hippeastrum, all native to tropical America, but only seven or eight of the most showy ones are generally cultivated. Some of these, such as *H. pardinum* and *H. Leopoldi*, naturally have blooms 7 or more inches across, others expand from 4 to 6 inches, so that hybrids bearing flowers nearly or quite a foot in diameter do not appear astonishing, in view of the results obtained during the last 100 years by European fanciers. The centre of interest in these showy blooms have been Belgium and England, where show varieties of the greatest perfection have long been raised. Some of these increase but slowly, and are held at comparatively high prices, £5 to £6 being frequently demanded for a single bulb; others in time becoming sufficiently numerous to be offered at reasonable rates. The effort is to develop flowers of symmetrical form and good habit, as well as of great size and rich colouring. Raisers are particularly anxious to get rid of the green centres so characteristic of many species, and which persistently crop up in their otherwise charming offspring. Among the many varieties, the following are most showy, and are easily cared for:—Charles Dickens, very large, pure white with faint rosy stripings; Chatrain, very large round blooms, orange, with scarlet featherings, immense foliage, profuse bloomer, usually producing eight flowers at once; Jeanne D'Arc, cream white, striped and margined crimson, well-formed blooms, six to eight at once; Defiance, vigorous and free, often blooming twice in a season, large flowers, deep-red, striped white; Prince of Orange, large flowers, orange and white with greenish centre; Johnsoni, an old favourite, having been raised by an English watchmaker named Johnson a century ago, and

largely grown in Bermuda and the Caribbean Islands, as well as in the warmer parts of our own country, deep-scarlet, striped with white down the centre of each petal; and Empress of India, dazzling scarlet—a little difficult to grow. The Nehrling and Burbank hybrids, with their stately growth, good finish, pleasing colour, and grateful perfume, are fine additions to the above list, which might be greatly extended. The window culture of Amaryllis is not difficult when the needs of the bulbs are considered. They should be kept in comparatively small pots of light rich soil, given abundance of light, heat, and water when growing, and stored in a warm dry place when at rest.

BEGONIAS.

There are several distinct groups of Begonias, most of which will thrive in the open in Queensland. The shrubby species, which flower at all times of the year, include a large number of species and varieties, among the latter being the beautiful "Gloire des Sceaux." The ornamental-leaved group, of which *B. Rex* is the type, includes many handsome-leaved varieties, and the tuberous group, which are treated as green-house plants.

Begonias have been highly improved of late years, and as they are admirably adapted for the green-house as well as for planting out in warm districts in sheltered positions, and are easy to grow, no lover of horticulture should neglect them.

Occasionally double tuberous Begonias bear both double and single flowers. This is easily accounted for. If the grower will observe the flowers of his single-flowered plants he will find that they are of two kinds—pistillate and staminate. Now, in the double-flowered plants the staminate flowers will be double, because the stamens have turned to petals, while the pistillate will remain as they are upon the single-flowered plants. There are no tuberous Begonias that bear all double flowers. They all vary in bloom as described.

As pot plants they require considerable attention in the matter of repotting. They thrive in ordinary compost made open with plenty of sand. The seed may be sown on the surface of well-drained pots or pans of such loam, and subjected to a heat of 65 degrees Fahr., a temperature easily obtained both night and day in Queensland in spring, which is the time to sow the seed. They do not require much water. The seeds take rather long to germinate, and do so irregularly. It is, therefore, necessary to carefully lift out the largest seedlings to make room for succeeding young plants. The tubers rest during the winter months, and they must be left unwatered during that period.

Begonias are invaluable for the decoration of the green-house or conservatory, where they produce a magnificent and dazzling display. Their handsome large flowers, often measuring 4 inches in diameter, are of the most brilliantly varied and delicately beautiful shades, from the purest white to the deepest crimson, including yellow, bronze, rose, and other intermediate shades. The tuberous-rooted Begonias are also eminently adapted for bedding, and are largely used in England and elsewhere for this purpose.

GOOD VARIETIES.

Laing's Gold Medal Hybrids, single and double; Benary's International Prize, single; *Tuberosa vittata*, flowers marked like a Carnation, with shades of white, yellow, and red; *Hybrida marmorata fl. pl.*: The plants are of sturdy habit, and produce upright-standing very double flowers of great size (up to 4½ inches in diameter), with beautifully spotted and marbled petals. When in full flower these robust free-blooming plants, with their ample dark-green foliage, are most attractive.

GLOXINIAS.

These are usually considered as hot-house plants, mainly because they require a temperature of from 60 to 80 degrees Fahr. to thrive to perfection. Such a temperature obtains in Queensland, on the coast, for nine months in

the year; and where cold draughts of air can be avoided, and a moist warm atmosphere can be secured or created, these beautiful plants may be raised without the aid of the green-house, and with certainty in the bush-house. Heavy rains are, however, inimical to them. Still, they are properly adapted for indoor culture. The Gloxinia is one of the handsomest tuberous plants in cultivation. The fleshy velvety leaves are extremely beautiful, and the most lovely combinations of colour are found in their large campanulate flowers, which stand 6 inches above their silky velvety leaves.

The colours of the flowers vary from deep-crimson to pure white, with a scarlet blotch on the throat, and violet with indigo spots.

The plant is a tender perennial which blooms for a long time. Plants are easily raised from seed, which should be sown early in spring in pots, with a very light sandy soil, spreading the minute seeds thinly over the surface. The pots must be placed in a brisk bottom heat, which can be obtained by arranging for them a box containing an inch or two of damp ashes at the bottom, and having a glass cover to ensure a moist heat by checking evaporation. The seeds soon germinate, and as soon as the plants are large enough to handle they should be pricked into pans, returned to bottom heat, and afterwards potted singly. By doing this, they will flower in the first season. The most suitable soil is a compost of light loam with a little peat and silver sand added. Apply weak liquid manure once or twice a week when the plants are in full growth. This will add to the size and intensify the colours of the flowers. The plants prefer shade; therefore the sun must not be allowed to shine on them. The atmosphere must be damp, but no water must touch the leaves or flowers.

As soon as the flowers begin to open, the plants may be removed to a temperature a few degrees lower than 60 or 70 Fahr. When the foliage begins to decay, water must be gradually withheld, and the leaves will fall off naturally. The pots may then be placed in a situation out of the way, not too cold nor too dry, or the tubers may be turned out of the pots and placed in boxes in a mixture of heath soil and cocoanut fibre, and placed on a shelf, the soil being kept sufficiently moist to prevent the tubers from shrivelling. As they begin to grow in early spring, place them in small pots and water them. When necessary, shift them to larger pots. Sow from September to December.

GOOD VARIETIES.

Gloxinia (*Hybrida grandiflora crassifolia*); Gloxinia, New French Tigred and Spotted Varieties: The finest of these most beautiful varieties, of immense size and great substance, rich colours; Gloxinia, Defiance, "The Scarlet Gloxinia": Large erect flowers, glowing crimson scarlet; the edges of the petals are delicately frilled, which adds considerably to their appearance; New Giant Gloxinia (*Gloxinia hybrida gigantea*): This strain produces flowers of quite unusual dimensions. If the seed is gathered only from strikingly beautiful flowers, the latter will measure from $4\frac{1}{2}$ to 5 inches across, and the show of colour thus produced is rich and varied in the extreme.

FREESIAS.

These charming tuberous plants were originally introduced from the Cape of Good Hope. They are very easily cultivated in ordinary garden soil, and, once planted, they may remain for years in the same place, blooming freely every year in the spring.

THE BEST VARIETIES TO PLANT.

Freesia refracta alba: The flowers, which are pure white, and occasionally marked with a violet line, have a delicious perfume, and are of great value for cutting. Each bulb bears one or more stems, with eight or ten flowers.

F. Leichtlini: White, passing to primrose, with orange veinings. *F. Armstrongi* (the Pink Freesia): A lovely, satiny-pink variety of these sweet-scented flowers.

RANUNCULUS.

All the Ranunculi are valuable as cut flowers. They grow freely in the open, but they require a very rich loam. Like many other bulbous and tuberous plants, contact of the tubers with manure is injurious, and usually fatal to them. In order, therefore, to enrich the soil, the best plan is to first remove 2 inches of the surface soil of the bed. Then break up the soil beneath to a depth of 15 inches, and mix with it one-third of its bulk of decayed horse and cow dung, in equal quantities. In about a month afterwards return the surface soil, and plant the tubers in it. The danger of contact between the tubers and the manure is thus avoided, whilst plenty of plant food has been provided for the roots to take up. Plant the tubers about 6 inches apart, covering them about $1\frac{1}{2}$ inches above the crown. Should the soil become dry in spring before the plants have flowered, a good watering ought to be given. To obtain blooms of best quality they should be shaded from the time they begin to expand. As soon as the leaves have faded the tubers should be lifted, kept in bags in a dry place, and replanted in March or April. Amongst

THE BEST VARIETIES ARE

Double Persian Ranunculus, which can be obtained in a number of varieties. The Persian Ranunculus is prized for its lovely form and its brilliant and attractive colours—white, scarlet, crimson, yellow, purple, black, &c. The flowers are beautifully imbricated, and as full and double as the finest Camellia or Rose. Double Turban: The Peony-formed flowers are larger than those of the Persian varieties. Their vivid flowers are very attractive. They differ from the Persian, not only in size, but also in colour, being more rose-like, and self-coloured. They are very effective in beds and in masses. French Ranunculus: Turbans—black, crimson, scarlet, yellow; Seraphique, citron yellow; *Viridiflora*, green, with a scarlet edge; *Grandiflora*, large crimson, with yellow stripes.

TUBEROSE.

The Tuberose (*Polyanthes tuberosa*) may be classed amongst the most lovely and popular of tuberous-rooted plants, admirable for the purity and fragrance of its white flowers, which are produced in summer.

It is one of the most beautiful summer-flowering bulbs in cultivation. The blooms are of the purest white, and of the most exquisite fragrance. The wax-like flowers are produced on tall racemes, and are admirably adapted for bouquets and button-holes, every pip being available. For these reasons they are cultivated in immense quantities in nearly all quarters of the world, more especially in Europe and in the United States of North America, and to a lesser extent in Australia, New Zealand, and Tasmania. They are very easy to cultivate, and thrive luxuriantly in the open in Queensland. They require a rich soil, rather sandy, and a warm situation.

GROWING BULBS IN WATER.

The cultivation of bulbs in water is a very easy and pleasant way of insuring a crop of flowers in the house. But we advise you not to attempt to grow Hyacinths in this way, as it is almost sure to result in failure. The Chinese Sacred Lily, and all other varieties of Narcissus or Jonquils, will do well either in water or soil. The following directions are taken from the "California Cultivator":—

One of the most artistic and inexpensive methods of cultivating blooming plants for home use is to grow bulbs in water. The Chinese are expert in this work, and at their New Year festival the streets of Honolulu show a profusion

of their Sacred Lily in full bloom (says the "Hawaiian Forester"). Very many varieties of flowering bulbs may be successfully grown in water, and it is surprising that this easy method of producing handsome blossoms should have been allowed to remain so long neglected.

In selecting bulbs for this purpose, large heavy ones should be chosen. In many cities glasses are made especially for the purpose of growing the handsome flowers of the Hyacinth, but any open bowl or vase can be used for these and other bulbs.

If grown in an open bowl, the bulbs selected for blooming should be supported with a sufficient quantity of clean small stones or pebbles, to allow the developed plants to retain their upright position. Water should then be poured over the stones until it reaches the base of the bulbs. The bowl should now be kept in a cool dark place until the roots have attained a good growth, care being taken to replace the water as it diminishes. When the bulbs are required to bloom, the bowl should be removed into a light warm atmosphere, when spikes of blossoms will soon be thrown up.

Besides the Chinese Sacred Lily or Narcissus, many other bulbs can be made to produce blossoms in this manner. Among these Hyacinths, Jonquils, and Crocuses have all produced satisfactory results.

THE AUSTRALIAN BUFFALO.

Mr. Alfred Searcy, in his new book, "In Australian Tropics," says of the buffalo in the Northern Territory of Australia that it is simply marvellous how the few animals which were turned loose when the old settlements were abandoned increased. In little over ten years nearly 50,000 hides were exported. The business of shooting the beasts for their hides was begun in a very small way during the eighties, but it suddenly became a regular industry, at which many men made a living. Buffalo shooting had the advantage of combining exciting sport with profitable work, as they are ridden down and shot from the saddle. Mr. Searcy mentions a particularly well-trained horse which was used for the work by a man named Cahill: "As soon as a mob of buffaloes was sighted the horse, as a matter of course, galloped alongside, while his master attended to his particular part of the game. Forty-five killed in one day proves that rider and horse understood the business thoroughly. When the shooting was finished for the day, the horse of its own accord would proceed to each carcass, and stand there till the skinning was finished." This horse at a word from his master would chase objectionable natives out of camp.

Some attempt, Mr. Searcy says, was made to tame these feral buffaloes, and use them for draught work, but no good result was achieved; they are too wild. A number were once rounded up and confined in a strongly-fenced yard, but by some oversight no provision was made for watering them. It was determined to drive them to water, and the attempt was made; but as soon as the yard was opened the herd took flight, and were seen no more. There was a story current that a man once succeeded, as he thought, in breaking a team of buffaloes to draught, and yoked them to a dray; he started, "and that was the last ever seen of man, buffaloes, or dray."

In connection with the above, it is interesting to learn that at last someone in the old country has come to believe in the existence of the buffalo in Australia. We have at this moment a most interesting story on the method of buffalo hunting in the Northern Territory. We sent this story to several London publishers, and all rejected it (though well and racily written), on the ground that "there were no buffaloes in Australia." The editors doubtless confused our buffaloes with the American bison.

Sericulture.

SILKWORMS, AND HOW TO REAR THEM.

The following paper on the production of silk has been kindly contributed by Mrs. J. South, wife of Captain J. South, late of the s.s. "Lucinda." Mrs. South has always taken great interest in the silk-producing industry, and is anxious to see it established in Queensland. Many years ago we remember boys and girls of the primary schools (as State schools were called in the early days) raising large numbers of silkworms, but nothing was done on a commercial scale. We ourselves sent two little bales of cocoons to England, where they realised 4s. per lb.

Mrs. South says:—

"The rearing of the silkworm and the production of silk has been successfully attempted in Queensland, but through lack of a suitable market the industry has practically ceased. The object of this paper is to point out that the climate and facilities of Queensland are such as to point to the probability of this becoming a lucrative employment in the near future.

"When in New York I visited a large silk manufactory in West Hoboken, New Jersey City, and was introduced to one of the leading men, who escorted me through the works. He presented me to the Japanese silk expert. This gentleman assured me that Queensland was a most suitable country for the rearing of the silkworm, on account of the warmth of the climate and the ease with which the necessary food could be obtained. This conversation led me to think of the advisability of laying my views on the matter before the public in the hope that something practical might eventuate.

"Both boys and girls find the rearing and management of the silkworm an agreeable and fascinating pastime, and I am sure country children would find a pleasure and profit in its cultivation. I would suggest that the matter be brought before the Educational Department, with a view to stimulating the interest of young people in this matter. Could a suitable market be ensured, it would open up a new industry both for young and old.

"In view of this matter coming to a practical issue, I submit a few facts on the management of the worm. The eggs should be placed in trays made of stiff white paper, and fully exposed to the heat of the sun, and should remain undisturbed until they begin to hatch. As the young worms appear they should be removed into other trays and fed on mulberry leaves, the leaf of the white mulberry being the best for this purpose. (The black mulberry, lettuce, and young grape also form good food.) They should be kept in a temperature ranging from 60 degrees to 70 degrees, in a place well-ventilated and preserved from damp or excessive dryness. Suitable rooms in which to rear the worm can easily be made on the following plan:—A kind of slanting shed made of rough wood, with slabs or tables around it, and windows to lift up on a hinge at the top, built where the sun's rays can help to bring the worm to perfection. In lifting the worms from one tray to another they should not be touched by the fingers, but removed by a camel hair pencil. The caterpillar has four moultings, each of which may be accomplished in four days, and during this time the insect requires the greatest attention. About thirty-two days after hatching the caterpillar has attained its full size. It now appears semi-transparent, ceases to eat, and prepares to spin. When this period arrives, instead of showing any migratory disposition, the worm seems to place itself with confidence under the care of man to provide it with a suitable place for its convenience and protection. What is called the cocoon nest is made by twisting the corners of a piece of writing paper and making a cornucopia, which should be affixed by a pin to the walls of the paper tray. Into each of these a single

worm should be placed. After the formation of the cocoon, care should be taken to prevent the chrysallis from eating through the walls of its silk dwelling. At least twelve cocoons at a time may be wound off by means of a winder affixed to an old machine. Where a large number of cocoons have been spun, the chrysalis may be killed by being exposed to the heat of a warm oven for ten minutes, when the silk may be wound off at leisure. The chrysalis retained for the purpose of breeding should be placed in bran, and in course of time turns into a moth. The male speedily dies; the female lays about 300 or 400 eggs and also dies.

“In conclusion, I express the hope that in a few years Queensland may become a home of silk culture.”

Some very erroneous and visionary impressions have prevailed regarding the profitableness of this industry. Some time ago, to prevent disappointment, the Department of Agriculture emphasised the fact that the profits of silk culture are always small, and that the elements of successful prosecution of the industry on a large scale in this State were then (1893) entirely wanting, and it was only recommended as a pleasant adjunct to the ordinary occupations of the farm, finding employment for those of the farmer's household not otherwise remuneratively employed. The want of a ready market for cocoons was then one of the chief drawbacks to any extended enterprise in cocoon raising. Until, therefore, the creation, by the establishment of silk-reeling factories or an export trade, of a profitable market for cocoons, intending sericulturists were earnestly advised to limit their operations. Coming to the present day, conditions have not materially changed, as, owing to labour conditions, such an industry could only be carried on by young people on the farm.

Commercially, sericulture may be divided into three branches:—

- (1) Raising seed (as the eggs are called);
- (2) Producing cocoons;
- (3) Reeling establishments.

RAISING SEED.

This used to be a very profitable industry at one time—and may be so again—when, owing to disease amongst the silkworms in Europe, a considerable demand sprang up for silkworm eggs, some millions of ounces being annually imported from Japan, China, and America. The price paid was often as much as £2 per oz., and the profits per acre in such case often reached £200. But since M. Pasteur introduced his system of egg selection, European silk-raisers have been able to produce their own seed. This branch of the industry, therefore, can only be profitable if the local demand is great, and then only to a few, as, after the first start, everyone would raise his own seed.

PRODUCING COCOONS.

This part of the business may be made to pay, but gives no fabulous profits, simply a fair income, easily earned, and at very little cost. The following figures will convey some idea of what can be done in cocoon producing:—Two ounces of eggs will contain 75,000 eggs at the very least (the number of eggs to the ounce varies with the variety, reaching as high as 50,000); 75,000 eggs with fair care will hatch out 75,000 worms; 75,000 worms, allowing 25 per cent. for deaths during rearing—a fair allowance—will produce 56,250 cocoons; 56,250 cocoons, allowing 300 to the lb., will yield 181 lb. of green cocoons; 181 lb. of green cocoons will sell for 1s. per lb., equal to £9 1s.; 181 lb. of green cocoons, when dried, will be reduced to 119 lb., and will sell for 4s. per lb., equal to £23 16s.; 56,200 worms will consume 3,200 lb. of mulberry leaves.

Now, the product in leaves of half an acre of mulberry trees, planted 4 feet apart—namely, 2,730 trees—when three and a-half years old, will be about 5,000 lb., or sufficient to feed twice this number of worms.

These figures are applicable to a district where the conditions exist for only rearing an *annual* silkworm. But in tropical districts, where climatic conditions enable a multivoltine species to be reared, four harvests of cocoons can be easily produced.

These returns are not very large, but are well worth earning, especially at work which is not at all laborious, and which will in no way interfere with other occupations.

SILK REELING.

This is the most profitable of all three branches, if carried out with skill and enterprise. But its establishment is attended with a good deal of risk, owing to labour in the State being so costly; and, furthermore, it requires skilled labour.

Cottage reeling appliances are procurable at a cost of about £10, but it is very questionable whether silk so reeled in small quantities would be marketable, because silk reeling requires skill, and with these small parcels of raw silk it would be almost impossible to get a uniform quality. The value of raw silk depends greatly on the uniformity of the threads, its cleanliness, tenacity, &c., so that, of the three branches of sericulture above mentioned, producing cocoons seems to be the only one left which gives promise of being a profitable undertaking.

VARIETIES OF SILKWORMS.

The silkworm proper, from which the ordinary commercial silk is produced—the mulberry-feeding silkworm—is the larva or grub of a small moth known as *Serica mori*, but there are so many intermediate forms that it has become customary to look upon all domesticated mulberry-feeding silkworms as belonging to one species—*Bombyx mori*, a univoltine—i.e., a species which goes through but one generation during the year.

Then, again, there are the bivoltines, trivoltines, and quodrivoltines, producing two, three, and four generations in the year. In India, there is a race of multivoltines, which go through as many as eight generations in one year.

The general silk crop of Europe, however, is produced by a variety of silkworm which thrives in a temperate climate, requires cold for the hatching of its eggs, and produces but one crop of cocoons in the year, and this is the most profitable. The multivoltine race would do well in the steamy climate of tropical Queensland.

THE LARVA OR WORM.

The silkworm goes through four moults or sicknesses known as “ages.” There are five of these ages:—

- (1) The period from the hatching out to the end of the first moult, usually occupying five or six days.
- (2) From the end of the first moult to the end of the second, occupying four or five days.
- (3) From the end of the second moult to the end of the third, about five days.
- (4) From the end of the third to the end of the fourth, from five to six days.
- (5) From the end of the fourth moult to the transformation of the worm into a chrysalis, usually occupying about nine days.

These periods vary somewhat, due to climatic influences and race of silkworms. The life of the worm, then, from its hatching out to the time of spinning the cocoon, varies from thirty to forty days.

Before each moult the worm generally fasts for two or three days. Every day it feeds, it consumes its own weight of leaves, but during the last few days before commencing to spin it consumes more than during the whole course of its previous existence.

The spinning of the cocoon usually occupies from three to five days, and after another three days it is transformed into a chrysalis.

In from two to three weeks after reaching the chrysalis stage, the skin bursts and the moth emerges, by moistening the end of the cocoon and pushing the silken threads asunder. The male moth is known from the female by the broader antennæ or feelers they possess.



Fig. 1.

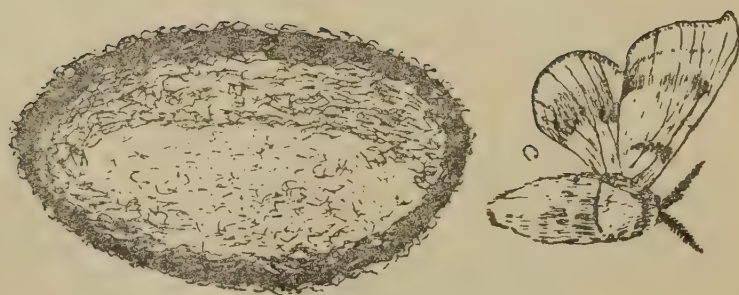
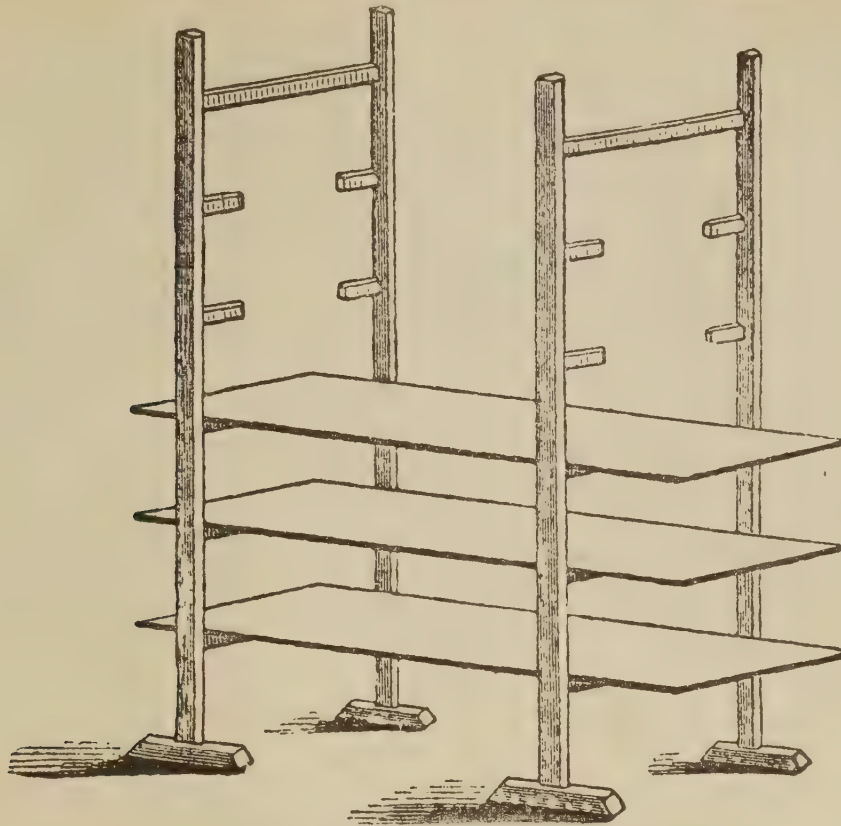


Fig. 2.

The sexes mingle soon after issuing from the cocoon, and some hours later the female begins to lay her eggs. The life of the moth extends to four or five days, but frequently to over a fortnight.

THE REARING HOUSE AND APPLIANCES.

An empty barn or outhouse can be utilised, or an inexpensive building of bark will do as well as a brick building. The size necessary for successfully



rearing the issue of 2 oz. of eggs would be a room 20 feet long, 12 feet wide, and 10 feet high. It should be capable of being well ventilated and warmed if necessary.

The interior should be fitted up with shelves or racks to hold the trays on which the silkworms are to be reared. Each rack should hold five or six tiers

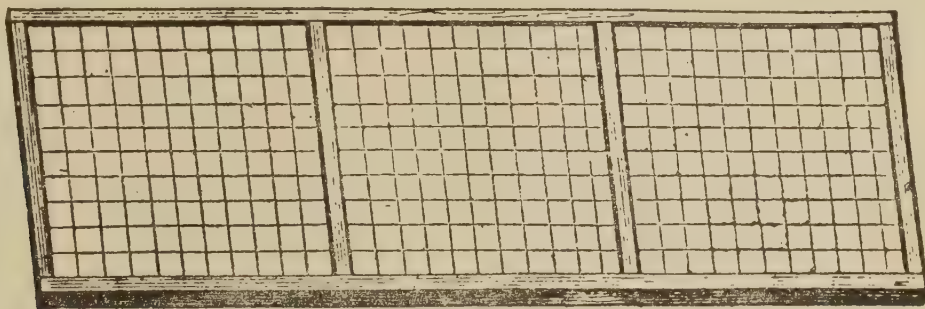


FIG. 1. — Wire-work shelf (after Roman).

of trays. The vertical distance between the shelves should not be greater than 20 inches. Wire netting for the trays is preferable, as it admits of better ventilation.

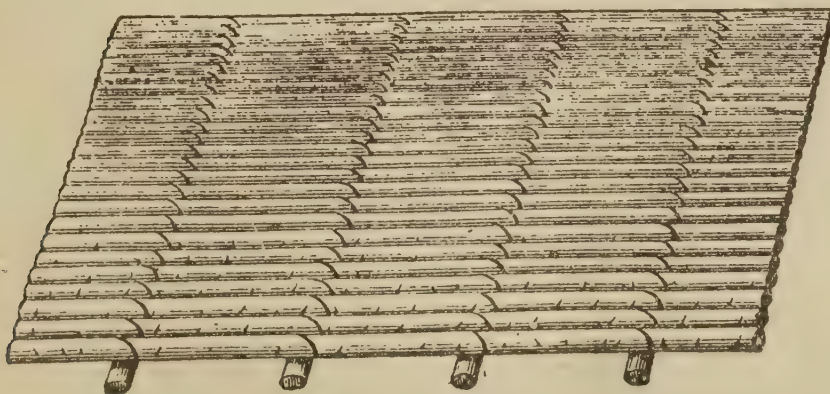


FIG. 1. — Shelf made of canes (after Roman).

In addition to the trays, a transfer tray of wire netting should be made with a large mesh, say $\frac{1}{4}$ -inch, the use of which will be explained further on. Four cocooning trays will be required 3 feet in diameter, within which is a long ribbon of plaited bamboo or matting 2 inches broad.

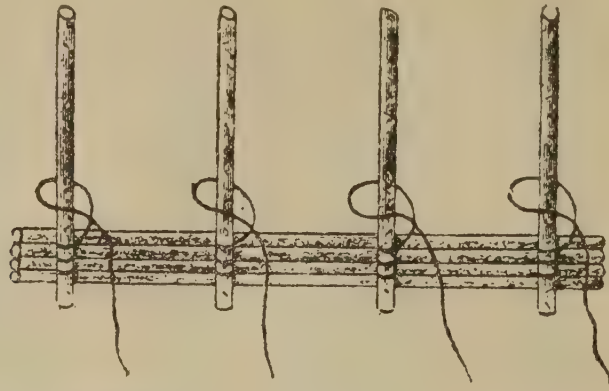


FIG. 2.—Construction of the cane shelf (after Roman).

Silkworms should never be handled, or at least as little as possible; and, as it becomes necessary, in order to clean up the litter made by the worms, to move them from one tray to another, the transfer tray above mentioned comes into use. One of these is placed over the tray containing the worms, and litter and fresh leaves are scattered over the top of it. The worms rise through the openings on to the leaves, when the whole are bodily moved to a fresh tray.

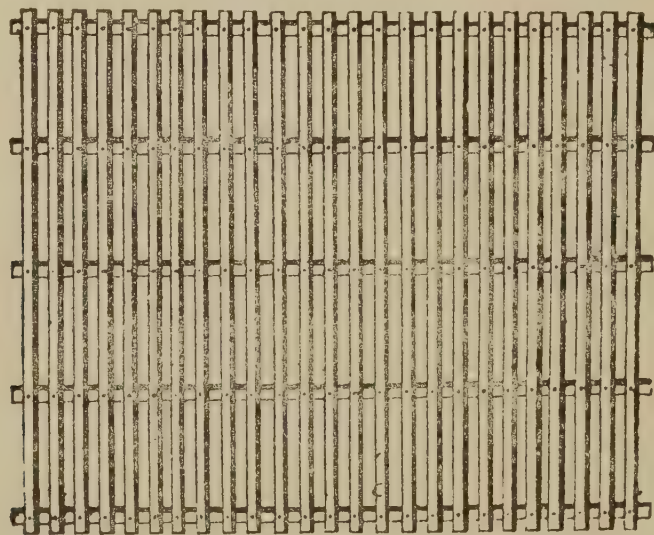


FIG. 2A.—Lattice-work transfer tray (original).

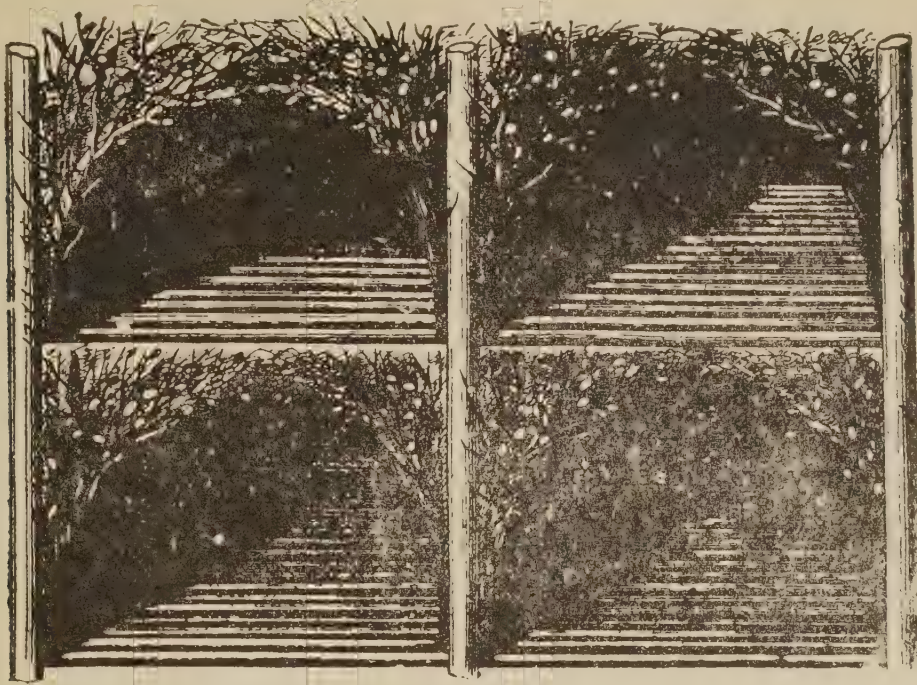
The first transfer, made shortly after the birth of worms, is accomplished by the aid of mosquito netting, which is laid over the hatching eggs, on which leaves cut small are placed. The tiny worms will soon rise through the meshes, and can easily be removed and tumbled out on to a tray. As they grow older, coarser and coarser mesh netting may be used.

FEEDING.

There are no definite rules as to feeding; only experience will teach what amount of food is wanted. But whenever leaves become dry they should be removed. A feed should be given in the early morning and the last thing at night always, additional meals being given during the day as the leaves are eaten. Do not keep too much food on the worms, or they will get buried and lost.

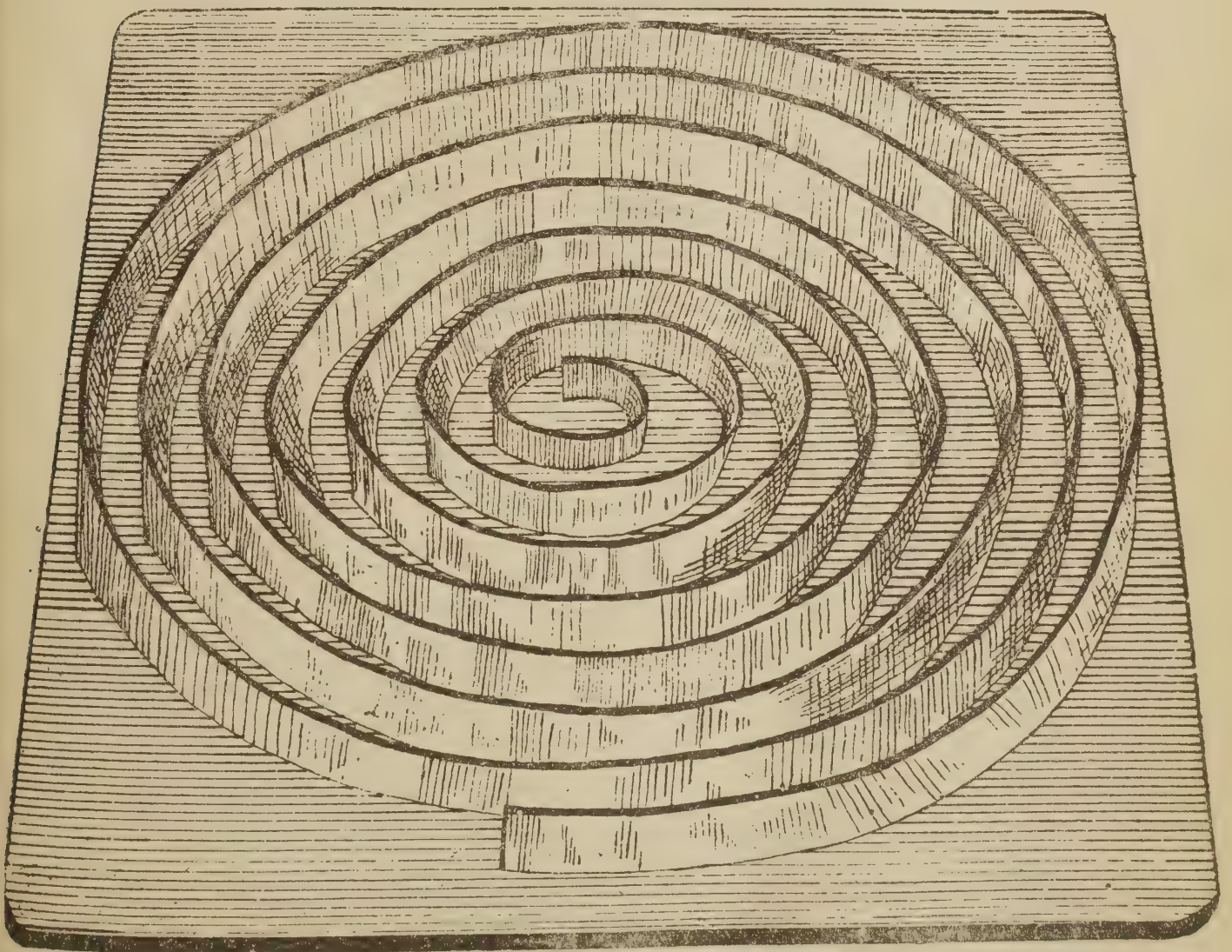
During the period of moulting no food is required, but as soon as the majority are right again feed them well. As the worms increase in size, feed them with maturer leaves, as these contain more nutritive matter; also allow them increased space.

Cleanliness is absolutely necessary for the development of healthy silkworms.



When the worms are ready to spin they lose appetite and become restless, and also throw out silk threads. Then place them in the cocooning tray, where arches of dry twigs may be built over them, the feet 10 or 12 inches apart, or they may be put into paper cocoons if raised in a small way.

When the cocoons are ready they must be sorted. The firmer they are, the better they are. The firm ones should be kept separate from the soft ones.



CHOKING THE CHRYSALIS.

During a Queensland summer the chrysalis is quickly killed and completely dried up by exposing the cocoons to the sun. In Europe, the cocoons are placed in a baker's oven heated to 200 degrees Fahr., or they are steamed, a very effective process. After steaming, the cocoons should be thoroughly dried. In sun-drying, after the cocoons have been two or three days in the sun they should be placed in the shade, spread out thinly, and for the first week frequently stirred. After remaining so for a month or two, the chrysalis inside becomes quite dry, and, as before observed, the cocoons can be kept for any length of time, care being taken, of course, to keep them out of the reach of rats and other vermin.

REPRODUCTION.

Before choking the chrysalis, a certain number of the best cocoons—the firmest and best coloured—are sorted out and put aside for future production. These cocoons may be either spread out on trays and left to themselves, or strung on a piece of thread (taking care not to send the needle through the chrysalis), and suspended in a room out of reach of rats, &c. In about three weeks' time the moth will make its escape, and the process previously described be repeated. The female moths should be placed on one or more trays, and allowed to lay their eggs as they please.

In our next we shall deal with the questions of food, mulberry planting, the great value of ramie (*Boehmeria nivea*) as a silkworm food, enemies and diseases of the silkworm, silk reeling and reeling appliances, and describe several varieties of silkworms.

Statistics.

COMMONWEALTH METEOROLOGY.
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1907.						1908.						
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.
<i>North.</i>													
Bowen	Nil	1.28	0.51	0.06	3.71	6.39	10.14	5.63	9.46	3.73	0.99	4.5	0.88
Cairns	0.12	0.39	1.35	0.68	5.35	28.33	27.02	8.03	20.60	5.99	3.05	5.9	3.70
Geraldton	2.39	4.66	1.36	1.42	6.45	33.82	44.39	13.27	39.00	14.23	18.52	2.64	8.11
Herberton	Nil	0.11	0.12	0.17	3.41	9.57	9.29	5.02	8.92	1.40	0.38	3.1	2.36
Hughenden	1.16	Nil	Nil	1.66	0.66	7.75	0.98	5.18	6.91	0.30	...	0.5	0.68
Kamerunga State Nurs.	0.13	1.15	1.19	0.53	2.76	29.82	...	7.47	25.75	4.60	3.363	0.76	4.85
Mackay	0.27	0.25	0.12	0.12	5.76	9.70	9.28	3.83	17.43	14.82	3.25	1.29	1.65
Rockhampton	0.84	0.47	Nil	0.47	3.72	4.42	3.84	9.64	9.77	2.62	0.85	0.10	1.08
Townsville	Nil	0.07	0.14	0.03	2.82	24.26	12.21	6.69	9.03	0.38	2.22	...	1.70
<i>South.</i>													
Biggenden State Farm	1.51	0.96	0.24	1.99	2.50	5.55	2.37	9.82	9.84	2.97	0.74	0.43	0.49
Brisbane	0.39	0.79	0.10	1.37	4.25	3.21	2.80	8.43	18.19	2.45	2.40	0.17	0.77
Bundaberg	0.87	0.43	Nil	1.70	2.90	2.99	4.77	2.82	7.35	4.13	0.67	0.39	0.75
Dalby	0.87	0.71	0.15	0.69	5.18	1.44	0.17	4.88	7.61	0.11	0.37	0.63	0.14
Esk	0.54	0.81	0.57	0.50	3.76	3.72	2.61	10.06	17.04	2.83	1.07	...	0.46
Gatton Agric. College	0.54	0.56	0.15	0.71	3.01	4.55	...	3.38	10.74	...	0.10	0.16	0.6
Gindie State Farm ...	1.58	0.10	0.16	0.61	1.57	4.42	0.20	7.17	6.25	0.02	0.112	...	0.40
Gympie	0.80	0.17	0.47	1.20	3.05	5.49	6.26	11.77	80.8	1.87	2.00	0.38	1.16
Ipswich	0.30	0.43	0.05	0.78	4.45	3.40	1.32	6.63	13.77	2.71	1.14	0.12	0.47
Maryborough	0.64	0.93	0.25	2.74	3.49	5.81	5.62	8.07	11.40	2.52	1.05	0.46	0.81
Roma	1.03	0.42	0.04	1.04	3.70	2.51	0.04	6.38	2.51	0.22	...	0.50	0.63
Roma State Farm ...	...	...	...	...	...	...	...	...	...	...	...	...	1.27
Tewantin	1.48	0.95	0.55	1.05	3.12	7.36	10.42	12.47	14.39	7.59	8.66	0.75	1.97
Warwick	1.16	1.37	0.01	1.37	3.25	3.13	0.76	4.52	6.65	1.40	0.15	0.80	1.24
Westbrook State Farm	1.04	1.78	Nil	1.08	4.76	3.23	0.43	8.03	1.41	1.40	00.5	...	0.49
Yandina	1.15	0.68	0.80	1.44	2.87	3.05	...	...	16.62	5.45	4.59	...	2.64

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered approximate only.

GEORGE G. BOND,
Divisional Officer.

Vegetable Pathology.

ON TWO PRICKLY PEAR AFFECTIONS.*

By H. TRYON, Entomologist and Vegetable Pathologist.

I.—DRY ROT.

OCCURRENCE.

This "disease" was encountered in prickly pear on the selections of W. Gibson, W. Burton, and in one other locality in the Goondiwindi district.

With the exception of the first of these occurrences, the ground in which the affected plants were met with was flat, and, in wet weather, liable to become water-logged; but, generally speaking, the land the scene of them apparently differed in no respect from that in which normally healthy plants grew. In every instance only individual plants here and there were subject to its presence, and with respect to these it was prevalent in varying extent.

During the four days (4th to 8th October) covered by the necessary field investigations, no perceptible increase in the manifestation of symptoms took place, and the same remark applies to portions of injured plants maintained in a living condition for nearly six months.

SYMPTOMS.

The appearances presented suggest the action of some corrosive fluid, although this explanation of their origin is perfectly untenable.

The earliest indication is afforded by the presence of spots or blotches of a greyish- or pale yellowish-brown colour. These have an irregular outline and wave-like extensions in different directions, as might some drop of fluid that had become flattened out and extended. They develop one or two brownish-cream-coloured markings about their centres, that unite and grow until the entire blotch is thus occupied. These ultimately cream-coloured spots or blotches are of every size, and, by confluence, may form archipelago-like patches. Both faces of a stem-section (or "racket") may exhibit their presence. Oftentimes it is affected along one edge, the alteration extending inwards to a varying degree, and in one or more places; sometimes entire "rackets" become implicated. All the stem parts of the plants, both young and old, may be affected in this way. Throughout the areas of different form and extent involved in these changes, the epidermis has already died, as is suggested by the colour it has acquired, and cracks and fissures develop either just within their borders, so as to isolate them from the surrounding green tissue, or are met with traversing them in different directions.

These fissures have the effect of exposing the subjacent green tissue of the "rackets" to the direct action of the surrounding air, with the result that this, which is very intolerant of its action, succumbs and to a greater or less extent, breaks down.

The affected portions of the stem-sections, which, as we have seen, may comprise their entire surfaces or any lesser portion of them, accordingly develop

* This preliminary statement—submitted in the form of a Report—is the outcome of an inquiry promoted by the Secretary for Public Lands—the Honourable J. T. Bell, M.L.A.—to whom the question of subjugating the notorious weed—the prickly pear (*Opuntia vulgaris*)—by disease had early been commended by the writer as one worthy of especial consideration.—H.T.

a shrunken appearance—the entire interior having collapsed—the external surface, in addition to exhibiting breaks in its continuity, being much wrinkled and puckered.

Meanwhile, these portions or the entire “rackets” dry up and become as brittle as biscuits, still, however, maintaining the pale colouration, and in this respect resembling them.

Only rarely, and when they consist of a few “rackets” only, are individual plants wholly affected in this way. Usually but a leaf here and there exhibits, with varying intensity, the symptoms described. Accordingly, it was nowhere observed to be a fatal affection, but, where best developed, to produce a retarding influence on growth only. By a small expenditure of time and labour, as effective results might arise from the application of arsenite of soda or of some such cacticide.

NATURE.

There is a sudden demarcation between the healthy green parts of the stem-sections and those parts subject to the alterations described. This remark applies not only to the external surface but to the underlying tissue comprising the substance proper of the plant. In the latter case, however, there is generally a brownish-coloured line separating the sound from the unsound.

At first, and when the marks are recently formed, the change undergone, and of which they are the indication, is quite superficial, and is restricted to the epidermis; and, if secondary changes do not ensue, no further alterations may take place, so that by scraping away the dead skin the subjacent deep-green substance of the leaf is brought into view.

When, however, with its death, this dry and discoloured epidermis cracks, and fissures develop, changes take place similar to those that result from a wound, and proceed to deeper and deeper depths in the tissue until the entire thickness of the stem-sections or “rackets” is involved.

Sooner or later the destructive alterations cease, and whatever portion of the stem-section has remained uninvolved in them manifests all the symptoms of life, and, even under the most uncongenial conditions for growth, may develop vigorous sprouts.

Apparently certain meteorological conditions determine the extent to which the destructive changes may proceed.

These changes are thus both partial and transitory in their effects, and so have but little, if any, influence in subduing the plants that exhibit them.

CAUSE.

The symptoms exhibited at an early period in the history of this prickly pear affection are, generally speaking, compatible with the action of some parasitic organism—of a fungus or bacterial nature. However, microscopical investigation fails to bring to light the presence of any such agent. Moreover, when kept under conditions favourable to their growth and manifestation, no micro-fungi capable of acting as parasites are found occurring, much less any one of the several kinds that are known to consort with *Opuntia* as a host-plant.

The features that are the earliest to be displayed suggest the action of some toxic fluid, formed within the plant tissue, and acting sporadically on the more superficial cells of the cortical layer of the plant, and on their contents.

No micro-chemical action of this character has, however, been determined, and it can, therefore, be conjectured only—if it indeed, actually takes place—in what it consists.

In this connection it may be remarked that in the prickly pear a singular feature is exhibited, consisting in the presence of a layer of cells, intervening

between the chlorophyll-containing palisade cells and the epidermis, each of which contains a large sphaerolith of oxalate of lime, and this is denotive of the fact that during the growth of the plant a large amount of oxalic acid is formed, probably in connection with the special metabolism involved.

Could we conceive that under exceptional circumstances the reduction of this oxalic acid takes place to form poisonous bodies—*e.g.*, glycollic or glycoxylic acids—that are created in the course of this process, prior to its being rendered inert through union with lime, such action would account for the figure that characterises the initial changes when first apparent—that of a drop of fluid flattened out. However—as I am assured—such action as is referred to is unknown to the physiology of plant-life.

CONCLUSION.

From what has been stated regarding the appearance of this prickly pear affection, and its nature, it will appear that it is not one of any economic importance, although not devoid of scientific interest.

At the time of my visit it had been under the observation of Mr. W. Burton for some weeks, and more recently had claimed the attention of his neighbour, Mr. W. Gibson, and no facts were communicated by either contrary to this opinion.

Efforts on my part to communicate it from one plant to another, or, indeed, from one stem-section to another of the same plant, yielded entirely negative results, and this, whilst again supporting the conclusion that we have not in it an instance of a parasitic disease, coupled with the fact that no instances of its spontaneous dissemination were encountered, is in keeping with the view that this judgment concerning it is a sound one.

At the same time, all abnormal features, especially of the nature of spontaneous destructive change in the prickly pear plant, merit, in the public interest, the fullest investigation, and it redounds, therefore, to the credit of the Commissioner of Crown Lands at Goondiwindi, F. W. Barlow, Esq., in that he not only brought this under the notice of the Secretary of Public Lands, but assisted in every way also in promoting the inquiry to which this report relates. The services of Messrs. W. Burton and W. Gibson, of the same district, are also worthy of record.

II.—SLEEPING SICKNESS.

OCCURRENCE.

This prickly pear affection was met with near Milmerran, in the parish of Domville, where it had been discovered by Crown Lands Ranger A. A. E. Brett. It is not of uncommon occurrence in the western districts of the State, the following being districts in which it has been seen:—

Jondaryan (G. F. W. Suzbier), Mamadhu (J. Coghlan), and Goondiwindi, as well as here and there in the intervening country. Isolated plants are victimised by it, and, where prevalent, the percentage of affected to non-affected ones is very small. It is the exception for two or more adjacently-growing plants to manifest it. The land on which it occurs may be well drained, but exhibits, apparently, no special character.

SYMPTOMS.

These symptoms denotive of the presence of Sleeping Sickness disease are at first very obscure, and are very gradually developed.

An affected plant, when the disease is but little pronounced, will be noticed to have its main stems spreading outwardly more horizontally than usual, and falling, as it were, from the centre whence they originate. The stem-sections, or “rackets,” instead of being glaucous-green as in the healthy plant,

present now a yellowish sickly cast of colour, with the "eyes," or arrested buds, it may be, set in purplish-red. Moreover, instead of their thick edges being turned upwards, they are more or less inclined. As yet, however, they are intact, without blemish. Again, the development of the plant seems to have ceased, there being no indications of recent growth; and any fruit that may be present is little in quantity, and presents a depauperated appearance. A prickly pear plant under the full influence of this "sleeping sickness" presents the following appearance:—It manifests a yellowish cast of colour, especially when viewed at a distance, for all portions are not quite alike in this respect. It has, moreover, a battered-down look, as if the branches of a tree has been imposed upon it. The main branches droop, and the stem-sections expose their faces upwards and downwards or lie almost horizontally. These "rackets" are again thin, allowing the fibrous meshwork of their substratum to be readily seen through their outer covering, and, moreover, tough, flaccid, and wrinkled. Some have conspicuous dead areas, extending to a greater or less distance inwards from their sides or ends. Other stem-sections, again, are dead, and have dried up. These readily fall off when touched, and many, having already dropped, occur in various stages of rottenness, bestrewing the ground. No recently-formed shoots or flower buds are connected with the affected "rackets." If fruit be present, it is in almost all cases pinched and wrinkled, and readily falls when anything is brought in contact with it.

In some cases one portion of a large plant is implicated in a more pronounced degree than is another. Plants affected in this manner seldom wholly succumb, although entire branches may die and come away. Evidently many weeks are occupied in reaching the fullest stage in the development of the malady, but the diseased condition seems to be more quickly realised in dry than in wet weather.

Affected plants have a very characteristic appearance, and, when this has been once realised, may be discerned from a considerable distance.

The symptoms presented are quite distinct from those evinced by *Opuntia* during dry weather, when growing in open wind-swept places on shallow soil, although in this case also we have the "rackets" thin and yellow-coloured, and often suffused with reddish-purple.

CAUSE.

On examining affected plants, neither destructive insect nor parasitic fungus is met with, although in the case of the dead and decayed stem-sections saprophytic organisms may ultimately darken the pale-brown colour that they exhibit.

The origin of the disease is to be found, however, not in the parts of the prickly pear above ground, but in the state of its roots.

These, even when the first recognisable symptoms are outwardly manifest, have undergone destructive change that, commencing from their free ends, has gradually extended along them to their point of origin in the central axis to a varying extent.

This change, that involves their death, is especially undergone by the white dense tissue (parenchyma) that surrounds the central woody cylinder or stele. This has, where already affected, completely broken down, becoming of the consistence and appearance of thick honey, and, like, some varieties of this, of a yellowish-brown colour. When this alteration has taken place, the epidermis or "skin" of the root is removable, like an egg shell, and, indeed, in eradicating a plant this may be left in the ground, forming an open cylinder, although oftentimes only the woody central cylinder remains to be taken up. As this root decay proceeds, there is an abrupt transition between that part of the root that is subject to change, and is still sound, and the soft and decayed portion beyond.

Evidently the root decay is inaugurated long prior to the time when the disease can be first recognised, as may be judged from the extent to which it has proceeded when this is the case. Even when the entire roots are destroyed, and the decay has extended in part to the central bulbous axis of the plant, the outward symptoms may not be developed to their fullest extent, especially should moist weather prevail. The casual agent of the disease is, of course, that which determines the commencement of this root-destruction, since, when a lesion has been once produced, wound-parasites may determine all after-effects. Owing to the circumstances above mentioned, great difficulty is involved in discovering this. Thus, in the present investigation, every plant examined evinced root decay that had already been long in progress.

The agent is evidently none of the higher fungi belonging to the group *Basidiomycetes*, or such as invest the roots of plants they victimise with conspicuous spawn-threads (mycelia).

At the junction of the sound and altered root tissue, where the former has commenced to soften, and where root decay is progressing, a delicate hyphomycetous fungus may be found vegetating that is quite distinct from others of the same class that are encountered further back, where it has produced its fullest effects in destroying the tissue.

The systematic position of this as yet awaits determination, and that it is the cause of prickly pear "Sleeping Sickness" is uncertain, seeing that it has not yet been found possible to infect healthy root tissue with the characteristic decay, in which material in which it is present has been used as the infective material.

However, this is a line of investigation that needs prosecution, having been only conducted to a very limited stage in this inquiry: the claims of other official duty having to be meanwhile satisfied.

DISSEMINATION.

The dissemination of the disease under natural circumstances is evidently slow, and proceeds to a very limited extent.

Plants affected to a pronounced degree may grow alongside other ones in the same patch without any evidence that they have served to communicate the disease to them being forthcoming. Again, seedling Prickly Pear plants may spring up from the ground occupied by the decayed roots of a victimised plant, and yet escape infection; and, moreover, healthy and diseased roots may intersect the same portion of soil, and yet maintain their respective conditions of soundness and unsoundness.

Usually the disease proceeds to a certain extent, and then its progress is stayed: the affected plant apparently producing new roots, or the portions above ground that have escaped destruction establishing new soil-connections.

With such methods as I have employed, and that have consisted in inoculating the plant and soil with root tissue, decayed or in process of decay, no positive result has been arrived at in establishing the disease. It is one that will bear further and more exhaustive examination; but, it being a root disease, it is not probable that means of artificially communicating it, if arrived at, will be of much avail.

In conclusion, it may be permitted to add that the zeal for the wider interest of his Department, that had evidently prompted Crown Lands Ranger A. A. E. Brett to call attention to the Domville occurrence of this prickly pear affection, was evinced also in his highly-appreciated efforts to promote this inquiry that he was thus instrumental in occasioning.

Science.

ARTESIAN WATER.

Queensland has an artesian area of 376,000 square miles, or, practically, it may be said that over one-half of the State has, flowing at various depths beneath the surface of the Western country, vast rivers of water, which, if everywhere tapped, would suffice to irrigate not only the artesian area, but, by means of creeks and watercourses, often dry for months and even years at a stretch, as in the five years preceding 1902, would also give vast supplies of water to considerable stretches of country outside the artesian area. Whilst, however, a majority of the 600 or 700 bores which have been put down yield constant supplies of excellent water, both for domestic and irrigation purposes, as well as for supplying steam boilers, there are some with a heavy flow of water impregnated with certain salts which make it unfit for any of these purposes. The problem has been how to get rid of these injurious salts, and so render the water sweet and useful. Mr. Percy Allan, principal assistant engineer for conservation of water in New South Wales, last year read the following paper, which indicates some of the possibilities for artesian irrigation presented by the recent discovery by Mr. R. S. Symmonds, of the New South Wales Department of Agriculture, whereby the alkaline artesian waters of Queensland, New South Wales, and South Australia may be made useful instead of poisonous to plant life:—

The great artesian basin as at present known spreads over the north and north-west of New South Wales, three-fifths of Queensland, and a considerable portion of the north and east of South Australia. The total estimated area of the whole artesian basin is 569,000 square miles or 364,160,000 acres, of which 376,000 square miles are, as above stated, situated in Queensland, 110,000 square miles in South Australia, and 83,000 square miles in New South Wales. The great mass of this enormous area is at present uncultivable for want of moisture, and when to this may be applied water, which not only affords the essential to plant life, but water which also contains the highly fertilising element of nitrogen, now missing from the artesian supplies, there are the elements of a prodigious development in both pastoral and agricultural pursuits.

Mr. Symmonds' scheme is very simple, and may be briefly stated as follows:—The objectionable compound in the artesian water usually obtained is carbonate of soda, which, while unpleasant to the taste, has also a deleterious effect on plant life, and, when brought into contact with soil, forms a chemical substance known as silicate of soda. This forms a hard silicious surface, which can hardly be broken by mechanical means, and which, even when it is desiccated, is of little use after it has become thoroughly impregnated for purposes of culture. Mr. Symmonds' idea is that the addition of nitric acid to the water would neutralise the objectionable effects of the carbonate of soda by converting it into the chemical product known as nitrate of soda, which is used the world over as a fertiliser. The effects have exceeded the discoverer's most sanguine expectations. He has proved by his experiments that the addition of nitric acid to soil impregnated with alkali procured from the neighbourhood of the bore at Moree has increased its fertility to a marvellous degree, and has converted what might be termed barren rock into soil which will grow wheat, for example, to an extent quite impossible even on the best agricultural lauds of the State.

With this object in view he obtained some alkaline soil that had been under irrigation by artesian bore water, and on 28th September, 1906, filled three

6-inch flower pots with the soil, No. 1 being the ordinary soil, Nos. 2 and 3 treated with nitric acid. Two grains of wheat were sown in each pot and



allowed to mature. The wheat was cut on 28th January, 1907, and the grain was weighed, giving the following results :—No. 1, untreated, 2·65 grammes of wheat ; No. 2, treated, 11·30 grammes of wheat ; No. 3, treated, 14·40 grammes of wheat. The latter showed more than five times the yield of the first-named, which was considered a very satisfactory result.

In order to make quite sure, he repeated the experiment, in duplicate, on 2nd February, 1907, and the photographs herewith illustrate the latter series of experiments. Although the season (winter) was against the growth and ripening of the grain, the results showed an increase of from eight to ten fold. The pot on the left of each photograph Nos. 1 and 5 contains the alkaline soil untreated ; the other pots contain the same soil in which the injurious effects of the alkali have been corrected by the addition of nitric acid. Nos. 2 and 6 received ·2 per cent., Nos. 3 and 7 received ·5 per cent., and Nos. 4 and 8 received 1 per cent. nitric acid.

Two grains only were grown in each pot, consequently it is fair to assume that the “stooling” properties of wheat are greatly assisted by the process, and, as the pots containing ·2 per cent nitric acid showed an increase in yield practically equal to those containing 1 per cent., it is only reasonable to suppose that the same result would be obtained by the use of a much lower percentage of acid.

Experiments on a larger scale, with from ·002 per cent. to ·25 per cent. nitric acid, on strongly alkaline soil from Moree are in hand. So far as they have progressed, the subsequent results are startling and convincing, and will form the subject of a subsequent article.

The mechanical power derivable from the pressure given in the outflow from artesian bores (some of the bores give a pressure so high as 150 lb. per

square inch) could probably be turned to account in producing on the spot electro-chemical nitric acid from the atmosphere, a process which is now being



successfully carried out in Europe at a cost of £8 3s. 6d. per ton. As the cost of raw material and power is zero—an occurrence unique in the industrial world—it is simply a question of plant, working expenses, and intelligent supervision.

A process to convert the atmospheric nitrogen into nitric acid has been recently investigated in Europe, and offer some novel features, which render it particularly applicable to our unique conditions, the high pressure artesian bores providing the power to produce from the atmosphere an antidote for their own toxicity, and thereby enormously increasing the fertility of the soil and rendering us independent of a precarious rainfall.

The workers of the process referred to state that they obtained a maximum output of 440 kilos nitric acid per kilowatt year when using a current of 0.05 ampere of 6,000 to 10,000 periods per second, at 50,000 volts, each arc absorbing 2.5 kilowatts. So that 2.5 kilowatts (about 3.4 h.p.) produced 1.1 ton of nitric acid per year.

A plant such as that mentioned could be duplicated according to the power available. There would not be any expensive transport or packing of the acid, and it would be quite unnecessary to concentrate it for our purpose. This would mean a considerable reduction in the cost of the plant and working expenses, and the advantage of this process is apparent when working on such a large area.

The whole scheme is fascinating and sound; the geologist, chemist, physicist, electrician, engineer, and agriculturist each play an important, well-established part, and the capitalist should not be slow to recognise the advantages of an enormously increased yield. To get, in one season, with one tillage, sowing, and harvesting operation, what under ordinary circumstances would take five or six years, and to get it practically for nothing, without risk, is an

occurrence extremely rare. The results so far achieved are phenomenal, and the process may fairly be regarded as worthy of being fully investigated in the field.



From these experiments, which must be regarded as purely of a preliminary nature, it is quite impossible to attempt to estimate the cost, and until the experiment has been tried in the field, on a comparatively large area, he would prefer not to express an opinion on this point.

It will be noticed that Queensland has an artesian area of 376,000 square miles, an area far in excess of the other States, and is thus far more deeply interested in Mr. Symmonds' discovery. Mr. Symmonds has, it is said, placed formally in the hands of the Queensland Government full details of his discovery and the results of his work. He asks now that some opportunity will be afforded him to give his discovery practical test. The importance of the matter cannot be gainsaid, so we trust it will not be long before Mr. Symmonds is allowed to put his discovery to a practical test in the Western districts of this State.

General Notes.

AGRICULTURAL COLLEGE EX-STUDENTS' CLUB.

ANNUAL GENERAL MEETING.

The annual general meeting of the ex-Students' Club of the Queensland Agricultural College was held in the board-room, at the offices of the Department of Agriculture and Stock, on Thursday, 13th August.

A satisfactory balance-sheet was presented, and final arrangements were made for the annual dinner to be held on the same evening at the Café Eschenhagen. A motion was also carried to admit present students at the College as club members at a fee of 5s. per annum.

THE ANNUAL DINNER.

The attendance at the dinner this year was larger than on any previous occasion, there being some sixty ex-students and guests present. Amongst the guests were Mr. X. A. Seppelt, a member of the Roseworthy Agricultural College, Adelaide, and Mr. Dravemann, of Doobie College, Victoria. The chair was occupied by the president, Mr. J. Mahon, Principal of the College, supported by the Acting Chief Secretary (the Hon. A. H. Barlow), the Minister for Agriculture (the Hon. T. O'Sullivan), and Mr. P. J. McDermott, I.S.O. (Under Secretary, Chief Secretary's Department), and Mr. E. G. E. Scriven (Under Secretary), and Mr. J. P. Orr (chief clerk, Department of Agriculture and Stock), Mr. P. McLean (late Under Secretary, Department of Agriculture and Stock). Amongst the other guests were Messrs. H. C. Quodling, R. Jarrott, H. Hindes, J. Liverseed, G. Brookes, E. Curney, J. T. Bailey, Sydney Dodd, A. H. Cory, G. Tucker, S. S. Hooper, M. Fern, J. Carew, R. A. Seppelt, R. E. Soutter, Thomas Jones, and thirty-two ex-students. Apologies were received from His Excellency the Governor, Sir Arthur Morgan (Lieutenant-Governor), the Hons. G. Kerr, J. W. Blair, P. Airey, A. G. C. Hawthorn, J. T. Bell, and Messrs. P. M. Pitt (secretary, Agricultural College), D. Macpherson (Biggenden State Farm), G. F. Campbell (Clifton), and H. E. Laffer (Roseworthy College). The latter was, however, represented by Mr. X. A. Seppelt.

After-dinner speeches were made by the president, by the Ministers present, and by some guests, and the members of the club.

Mr. Mahon, in opening the latter proceedings, expressed himself as very much pleased with the large attendance of ex-students, all of whom he was glad to know had been successful in life since leaving the College. Fully 75 per cent. of the students who had been under him were on the land, and one, he knew, was receiving £500 a year in Victoria, in connection with dairying. Mr. Mahon paid a graceful tribute to the veteran organiser of the Agricultural Department, Mr. Peter McLean, and also spoke in laudatory terms of the work of Messrs. Winks and McGrath.

Messrs. Jarrott and Hindes followed with short suitable speeches.

Hon. A. H. Barlow made a happy speech.

Hon. T. O'Sullivan gave some account of his experiences in his late Northern tour, and enlarged greatly on the enormous extent of the State and its resources, especially in sheep in the West and sugar in the North, and emphasised the terrible want of population in the State. In mentioning State farms and College, he showed clearly the great benefit they are to the State, even as much by their failures, from which all farmers are benefited, as by their successes. They also had the good effect of inducing lads to go on the farm, and he said to them, "Go on the land, by all means."

Mr. P. J. McDermott not only made a speech, but also gave a humorous recitation. The burden of his speech was the absolute necessity for toil, incessant toil, to achieve success.

Mr. Scriven and Mr. McLean made short pleasant speeches, which were responded to by Messrs. Seppelt, Corser, Webb, Dravemann, Hindes, and others.

After conclusion of the evening, the health of the secretary to the club (Major A. J. Boyd) was drunk with musical honours. Major Boyd suitably responded.

We advise all ex-students of the College to join the club, which makes for the benefit not only of members but of the agricultural community generally. Scattered far and wide over the State as they are, these young pioneers of agriculture have a most varied experience of the conditions under which farming, fruit-growing, dairying, stock-raising are carried on in widely separated districts from South to North and East to West. The proposal, which was unanimously carried at the meeting, that present students of the College be eligible for membership is an excellent move in the right direction, and we trust that many will avail themselves of the privilege. Several hundreds of students have passed through the College, and of these the Principal said that 75 per cent. are on the land and doing well. This shows the great value of the College education. Previous to its being established, the failures in farming were numerous, for the simple reason that those who took up the work had no idea of how to work the land to the greatest profit. Neither did they understand anything about modern machinery either for working the land, harvesting crops, or for dairy work. To-day students leave the College equipped with both practical and theoretical instruction, with the result that, as before said, those who took up rural industries are all making or have made comfortable homes and fair incomes for themselves.

On Monday, 17th August, a deputation of members of the ex-Students' Club paid a surprise visit to the secretary, Major Boyd, and presented him, on behalf of the members, with a case of valuable pipes, inscribed with the legend, "Presented to Major Boyd by members of the Q.A.C. Old Boys' Club, 13-8-08." The recipient expressed his appreciation of this most appropriate gift, and promised to do all he could in the future, as he had tried to do in the past, for the welfare of the club. The presentation was made by Messrs. Binnie and Rochat on behalf of the members.

Answers to Correspondents.

OSTRICH FARMING.

ENQUIRER, Tambo.—

1. We only know of one person in Queensland who has commenced breeding ostriches—Mr. T. Behan, of Garfield, near Jericho, on the Central Railway line. Some time ago he purchased a pair of ostriches in South Australia, with the idea of trying how the birds would thrive in Western Queensland desert country. The experiment, we are informed, has been a decided success. For a first plucking of plumes of four months' growth, weighing 2 lb., Mr. Behan obtained £30. The female ostrich, some time ago, had laid twice, hatching out thirteen chickens at the first sitting and seven at the second.

That ostrich farming is a very profitable business is shown by the fact that a Bill has been passed in Cape Colony making it a criminal offence to export ostriches. Even if the Bill were not passed, there would still have remained an export duty of £100 per head.

During the year 1904 the production of feathers in South Africa amounted to 470,036 lb., of a declared value of £1,058,355. A further increase took place in 1905, for the value shipped to the markets of the world stood at £1,120,298. For 1906, the value shipped stands as a record, amounting to 547,700 lb., worth £1,406,000. The last census gave the number of domesticated birds as 358,370, as against 154,880 in 1861.

In America, where ostrich-raising has been followed for only a few years, they are held in much esteem. It is said that the Nice farmer only calculates on bringing out and rearing 60 birds from every 600 eggs, but even then he counts on doubling his flock every year.

2. Your inquiries about Angora goats are answered in an article on the subject in this issue of the Journal, and you will also find voluminous information about Angora breeding and mohair in Vols. V. to XIX. of the Journal.

FOOD VALUE OF CANE TOPS.

H. T., South Kolan.—

Green sugar-cane tops are a very valuable fodder, and have as much food value as green maize, sorghum, and similar crops.

COW WITH CONGESTED UDDER.

JOHN HUNGERFORD, Canaga, Chinchilla.—

Mr. Sydney Dodd, Chief Veterinary Surgeon, Department of Agriculture and Stock, gives the following reply to your question:—

The term "congested" udder is often used by stock-owners for "inflammation" of the udder.

Simple congestion of the udder seldom lasts longer than about ten or twelve days, but if often ends in acute inflammation after two or three days. The former should be treated by frequent milking, and the application of hot fomentations, followed by belladonna ointment to the udder.

Inflammation of the udder is a more serious complaint, but may be prevented to a great extent by paying strict attention to cleanliness, avoiding over-stocking, and by treating injuries, &c., to the teat or udder promptly. Contagious inflammation of the udder is a disease caused by specific organisms

which may be introduced into a herd by an infected cow, and is then spread from cow to cow owing to the milker's lack of attention to personal cleanliness or by the milking utensils.

Generally speaking, in cases of inflammation of the udder, belladonna ointment should be applied to relieve pain, and the udder stripped every hour.

The bowels should be kept open by moderate doses of Epsom salts.

The teats may be injected with a warm solution of boracic acid ($\frac{1}{2}$ -oz. to a pint of water once a day) after stripping, if absolute cleanliness can be observed with the instruments. If not, it is better not to inject the teats at all, owing to the risk of making matters worse.

Cows affected with inflammation of the udder should not be milked with a milking machine. If possible, a person milking an affected cow should not milk healthy ones, and the milker's hands should be washed in a solution of a disinfectant after every milking, as infection is often conveyed from a diseased cow to a healthy animal by neglecting this precaution.

It is hardly necessary to state that milk from affected cows is unfit for human consumption, and if fed to stock should be well boiled first. Milk from cases of contagious inflammation should be destroyed.

Times of Sunrise and Sunset at Brisbane, 1908.

DATE.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON. H. M.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.3	5.34	5.29	5.47	4.58	6.5	4.46	6.28	4 Sept. ☾ First Quarter 6 51 a.m.
2	6.2	5.34	5.28	5.48	4.57	6.6	4.46	6.29	10 „ ○ Full Moon 10 23 p.m.
3	6.1	5.35	5.27	5.48	4.57	6.7	4.46	6.29	17 „ ☾ Last Quarter 8 33 „
4	5.59	5.35	5.25	5.49	4.56	6.8	4.46	6.30	26 „ ● New Moon . 0.59 a.m.
5	5.58	5.35	5.24	5.49	4.55	6.8	4.46	6.31	
6	5.57	5.36	5.23	5.50	4.55	6.9	4.46	6.32	
7	5.56	5.36	5.22	5.50	4.54	6.10	4.46	6.32	
8	5.55	5.37	5.21	5.51	4.53	6.10	4.46	6.33	3 Oct. ☾ First Quarter 4 14 p.m.
9	5.54	5.37	5.20	5.51	4.53	6.11	4.46	6.34	10 „ ○ Full Moon 7 3 a.m.
10	5.53	5.38	5.19	5.52	4.52	6.12	4.47	6.35	17 „ ☾ Last Quarter 1 35 p.m.
11	5.52	5.38	5.18	5.52	4.52	6.13	4.47	6.35	25 „ ● New Moon 4 47 „
12	5.51	5.39	5.17	5.53	4.51	6.13	4.47	6.36	
13	5.49	5.39	5.16	5.54	4.51	6.14	4.47	6.36	
14	5.48	5.39	5.15	5.54	4.50	6.15	4.48	6.37	
15	5.47	5.40	5.13	5.55	4.50	6.16	4.48	6.38	2 Nov. ☾ First Quarter 0 16 a.m.
16	5.46	5.40	5.12	5.55	4.49	6.16	4.48	6.38	8 „ ○ Full Moon 5 58 p.m.
17	5.45	5.41	5.11	5.56	4.48	6.17	4.49	6.39	16 „ ☾ Last Quarter 9 41 a.m.
18	5.43	5.41	5.10	5.56	4.48	6.18	4.49	6.40	24 „ ● New Moon 7 53 „
19	5.42	5.42	5.9	5.57	4.48	6.19	4.49	6.40	
20	5.41	5.42	5.9	5.58	4.48	6.20	4.50	6.41	
21	5.40	5.43	5.8	5.58	4.47	6.20	4.50	6.41	
22	5.39	5.43	5.7	5.59	4.47	6.21	4.51	6.42	1 Dec. ☾ First Quarter 7 44 a.m.
23	5.38	5.44	5.6	5.59	4.47	6.22	4.51	6.42	8 „ ○ Full Moon 7 44 „
24	5.37	5.44	5.5	6.0	4.47	6.23	4.52	6.43	16 „ ☾ Last Quarter 7 12 „
25	5.35	5.44	5.4	6.1	4.46	6.23	4.53	6.43	23 „ ● New Moon 9 50 p.m.
26	5.34	5.45	5.3	6.1	4.46	6.24	4.53	6.44	30 „ ☾ First Quarter 3 40 „
27	5.33	5.45	5.2	6.2	4.46	6.25	4.54	6.44	
28	5.32	5.46	5.1	6.3	4.46	6.26	4.54	6.44	
29	5.31	5.46	5.1	6.3	4.46	6.26	4.55	6.45	
30	5.30	5.47	5.0	6.4	4.46	6.27	4.55	6.45	
31	...	...	4.59	6.5	...	...	4.56	6.46	

The Markets.

PRICES FOR FRUIT—ROMA-STREET MARKETS.

Article.	JULY.	
	Prices.	
Apples, per case	7s. 6d. to 10s.	
Apples, New England, per packer	...	
Apricots, Local, per packer	...	
Bananas, Fiji, per case	...	
Bananas, Fiji, per bunch	...	
Citrons, per cwt.	11s. 3d. to 11s. 5d.	
Cumquats, quarter-case	...	
Custard Apples, per case	3s. 6d. to 5s.	
Gooseberries, per quarter-case	3s. 6d. to 4s. 9d.	
Lemons (Lisbon), per case	2s. to 4s. 5d.	
Lemons, rough, per case	2s. 6d. to 5s.	
Mandarins, per case	1s. 6d. to 5s.	
Oranges, Queensland, per case	4s. to 4s. 10d.	
Passion Fruit (Local), per case	...	
Papaw Apples, per quarter-case	1s. to 1s. 6d.	
Persimmons, per case	...	
Pineapples, rough, per dozen	3d. to 9d.	
Pineapples (Ripley's), per dozen	7d. to 10d.	
Pineapples, smooth, per dozen	6d. to 2s.	
Rosellas, per sugar bag	...	
Strawberries, per tray	...	
Strawberries, per dozen boxes	...	
Tomatoes, per quarter-case	3s. to 5s.	

SOUTHERN FRUIT MARKET.

Apples, local, per bushel case	9s.
Apples, Tasmanian, Eating, per case	5s. to 11s.
Apples, Tasmanian, Cooking, per case	2s. to 5s.
Bananas, Fiji, per case	15s. 6d. to 16s.
Bananas, Fiji, per bunch	2s. 6d. to 8s.
Bananas, Queensland, per case	12s. to 13s.
Bananas, Queensland, per bunch	2s. to 6s.
Bananas, Sugar, Queensland, per double case	10s.
Chillies, per bushel	8s. 6d.
Custard Apples, per case	3s. to 5s.
Gooseberries, per quarter-case	3s. 6d. to 4s. 9d.
Loquats, per case	7s.
Mandarins (Local), per case	8s. 6d. to 9s.
Mandarins, Emperor, per case	5s. to 6s. 6d.
Oranges, Queensland, per case	6s. 6d. to 7s. 6d.
Oranges (Local), per case	8s.
Oranges, Queensland, Navel, per case	10s.
Passion Fruit, per half-case	4s. 6d.
Pears, Victorian, per bushel case	20s.
Pears, Tasmanian, per half-bushel case	6s.
Pineapples, Queensland (smooth), per dozen	3s. 6d. to 5s.
Pineapples, Queensland (Ripley's), per dozen	4s. to 4s. 6d.
Pineapples, Queens, per dozen	3s. 6d. to 5s.
Pineapples, Queensland, common, choice, per dozen	3s. to 4s.
Pineapples, Queensland, medium, per dozen	2s. 6d.
Strawberries, Queensland, per three-quart tray	4s. 6d. to 5s.
Strawberries, Queensland, small, per three-quart tray	2s. to 3s.
Tomatoes, Queensland, choice (coloured), per box	2s. 6d. to 4s. 6d.
Tomatoes, green, per quarter-case	2s. 6d. to 3s. 6d.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR AUGUST.

Article.							AUGUST.	
							Prices.	
Bacon, Pineapple ...	...	...	...	...	...	lb.	7d. to 9d.	
Bran ...	...	...	...	...	...	ton	£7	
Butter, Factory ...	...	...	...	...	...	lb.	1s. 4d. to 1s. 6d.	
Chaff, Mixed ...	...	...	...	...	...	ton	£3 to £5 10s.	
Chaff, Oaten ...	...	...	...	...	...	,,	£6 10s. to £8	
Chaff, Lucerne ...	...	...	...	...	...	,,	£6 to £6 10s.	
Chaff, Wheaten ...	...	...	...	...	...	,,	£4 10s. to £5 10s.	
Cheese ...	...	...	...	...	...	lb.	8d. to 9½d.	
Flour ...	...	...	...	...	...	ton	£10 to £10 10s.	
Hay, Oaten ...	...	...	...	...	...	,,	£8 to £9	
Hay, Lucerne ...	...	...	...	...	...	,,	£3 to £5 10s.	
Honey ...	...	...	...	...	...	lb.	2½d. to 3¼d.	
Maize ...	...	...	...	...	...	bush.	4s. 3d. to 4s. 3½d.	
Oats ...	...	...	...	...	...	,,	3s. 9d. to 4s. 3d.	
Pollard ..	...	...	...	...	...	ton	£7	
Potatoes ...	...	...	...	...	...	,,	£8 to £10 15s.	
Potatoes, Sweet ...	...	...	...	...	...	,,	...	
Pumpkins ...	...	...	...	...	...	,,	...	
Wheat, Milling ...	...	...	...	...	...	bush.	5s.	
Wheat, Chick ...	...	...	...	...	...	,,	4s. 9d. to 5s.	
Onions ...	...	...	...	...	...	ton	£11	
Hams ...	...	...	...	...	...	lb.	10½d. to 1s.	
Eggs ...	...	...	...	...	...	doz.	7d. to 7½d.	
Fowls ...	...	...	...	...	...	pair	2s. 6d. to 4s. 3d.	
Geese ..	...	...	...	...	...	,,	...	
Ducks, English ...	...	...	...	...	...	,,	3s. to 3s. 6d.	
Ducks, Muscovy ...	...	...	...	...	...	,,	3s. 10d. to 4s. 6d.	
Turkeys (Hens) ...	...	...	...	...	...	,,	6s. to 7s.	
Turkeys (Gobblers)	...	...	...	...	...	,,	9s. to 13s.	

ENOGGERA SALEYARDS.

[illegible]

Orchard Notes for October.

By ALBERT H. BENSON, M.R.A.C.

THE SOUTHERN COAST DISTRICTS.

As October is often a dry month throughout the greater part of the State, one of the most important duties of the fruit-grower is to keep his orchard or vineyard in a thorough state of cultivation, thus retaining the moisture in the soil that is essential to the setting and development of the fruit crop. As long as the land is level, one cannot over-cultivate, as there is no danger of the soil washing, but when the orchard is on a hillside heavy thunderstorms, which may occur during the month, are very apt to cause heavy washaways of soil if the land is kept in the high state of tilth necessary to retain moisture. In this case, the cultivation should always be across and not up and down the face of the hill, and where the soil is of such a nature that it will wash badly then blocks, consisting of a row or two of a growing crop or of light timber, brush-wood, or even a body of weeds or heavy mulching, should be provided, such blocks to follow the contour of the orchard. If dry, and water for irrigation is available, citrus trees will be the better for a thorough watering during the month. Give the trees a good soaking, and follow the irrigation by systematic cultivation, as this is much better than constant surface watering, as practised by the Chinese. Examine the orchard and vineyard carefully for pests of all kinds. When young trees are showing signs of scale insects, cyanide same; when leaf-eating insects of any kind are present, spray the plants that are being attacked with Kedzie's mixture. Look out carefully for black spot and oidium in grape vines, using Bordeaux mixture for the former and sulphur for the latter. When using sulphur, see that you get a fine sample—viz., one in which the particles of sulphur are in a very fine state—as the finer the sulphur the better the results. Do not apply the sulphur in the early morning, but during the heat of the day, as it is the sulphur fumes, not the sulphur, which do the good. A knapsack sulphurer is the best machine for applying sulphur to grape vines, trees, or plants.

Examine any late citrus fruits or early summer fruits for fruit fly, and take every precaution to keep this great pest in check now, as, if fought systematically now, it will not do anything like the same amount of damage later on as if neglected and allowed to increase unchecked. October is a good month for planting pineapples and bananas. Be sure and have the land properly prepared prior to planting, especially in the case of pineapples, as the deeper the land is worked and the better the state of tilth to which the surface soil is reduced the better the results, as I am satisfied that few crops will pay better for the extra work involved than pines.

TROPICAL COAST DISTRICTS.

As the fruit fly usually becomes more numerous at this time of year, the netting of bananas is essential. Banana and pineapple plants may be set out, and the orchards should be kept well tilled, so as to have the land clean and in good order before the heavy summer growth takes place.

All the spring crop of citrus fruit should be now marketed, and the trees, where necessary, should be pruned and sprayed, and the land be well ploughed. The ploughing should be followed by harrowing and cultivating, so as to get the surface of the land into good order. Granadillas and pawpaws should be shipped to the Southern markets, as, if care is taken in packing, and they are sent in the cool chamber, they will carry in good order. These fruits should not be gathered in an immature condition, as, if so, they will never ripen up

properly. They should be fully developed but not soft, and if gathered in this condition, carefully handled, and packed and shipped in cool storage, they will reach the Southern markets in good condition, and, once they become more commonly known, will meet with a ready sale.

SOUTHERN AND CENTRAL TABLELANDS.

In the Stanthorpe district, the spraying of apple and pear trees for codlin moth will have to be carefully carried out, the best spray being the arsenical mixture known as "Kedzie's," which has been described from time to time in this Journal.

Where fungus diseases, such as powdery mildew, &c., are also present, Bordeaux mixture should be combined with the arsenical spray.

The vineyard will require considerable attention, as the vines must be carefully disbudded, and any signs of oidium or black spot should be checked at once. Look out for late spring frosts, and, if possible, try the effect of smudge fires producing dense smoke for preventing any damage.

Keep the orchards and vineyards well cultivated, as it is of the utmost importance to keep the moisture in the soil at this time of the year if a good fruit crop is to be secured.

In the warmer districts cultivation is all-important, and where irrigation is available it should be used for both fruit trees and vines, a thorough soaking followed by systematic cultivation being given.

Farm and Garden Notes for October.

FIELD.—With the advent of warmer weather and the consequent increase in the soil temperature, weeds will make great headway if not checked; therefore our advice for last month holds good with even greater force for the coming month. Earth up any crops which may require it, and keep the soil loose among them. Sow maize, sorghum, setaria, imphee, prairie grass, panicum, pumpkins, melons, cucumbers, marrows. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, chicory, and ginger. Coffee plants may be planted out. There are voluminous articles in previous Journals giving full instructions how to manage coffee plants, from preparing the ground to harvesting the crop, to which our readers are referred. The planting of the Sisal Agave and the Fourcroya may be proceeded with at any time of the year, but the best time is in spring and beginning of summer, when warm weather and good showers will enable the young plants to root quickly and become firmly established before the winter. The demand for the fibre is constantly increasing, and the supply does not nearly overtake the demand; hence prices keep high, and the outlook for the future is very promising. See our instructions in "The Sisal Industry in Queensland," obtainable free by intending planters on application to the Under Secretary, Department of Agriculture and Stock. Plant only on dry or well-drained soil. Cotton may still be sown.

KITCHEN GARDEN.—Our notes for this month will not vary much from those for September. Sowings may be made of all kinds of vegetables. We would not, however, advise the sowing of cauliflowers, as the hot season, fast approaching, will have a bad effect on their flowering. French beans, including butter beans, may be sown in all parts of the State. Lima and Madagascar beans should also be sown. Sow the dwarf Lima beans in rows 3 feet apart with 18 inches between the plants. The kitchen garden should be deeply dug and the soil reduced to a fine tilth. Give the plants plenty of room, both in sowing and transplanting, otherwise the crops will be drawn and worthless. Thin out melon and cucumber plants. Give plenty of water and mulch tomato plants planted out last month. Asparagus beds will require plentiful watering and a good top-dressing of short manure. See our instructions in "Market Gardening," obtainable on application to the Under Secretary, Department of Agriculture and Stock. Rosella seeds may be sown this month. No farm should be without rosellas. They are easily grown, they bear heavily, they make an excellent preserve, and are infinitely preferable to the mulberry for puddings. The bark supplies a splendid tough fibre for tying up plants. The fruit also makes a delicious wine.

FLOWER GARDEN.—The flower garden will now be showing the result of the care bestowed upon it during the past two months. The principal work to be done this month is the raking and stirring of the beds, staking, shading, and watering. Annuals may be sown as directed for last month. Plant chrysanthemums, gladiolus and other bulbs, such as tuberoses, crinum, ismene, amaryllis, pancratium, hermocallis, hippeastrum, dahlias, &c. Water seedlings well after planting, and shade for a few days. Roses should now be in full bloom. Keep free from aphids, and cut off all spent flowers. Get the lawn-mower out and keep the grass down. Hoe the borders well and trim the grass edges.

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NOTICE.

Queensland Agricultural Journal.

It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

Persons resident in Queensland whose main source of income is from Agricultural, Pastoral, or Horticultural pursuits, which fact should be stated on the attached Order Form, will receive the *Journal* free

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Amount of one year's subscription should therefore be forwarded with Order Form, without delay, to the UNDER SECRETARY, Department of Agriculture and Stock, Brisbane.

All subscriptions received for the *Journal* after the seventh day of the month will commence with the month after that on which payment is received. Previous copies available will be supplied at 6d. per copy.

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Agriculture.

THE JACKSON POTATO-DIGGER.

During the month of August several trials of the Jackson potato-digger were carried out, and all went to prove the perfect adaptability of the machine for the work it is intended to do. At the last demonstration there was a large assemblage of farmers and others interested in agriculture at Mr. Mullin's farm, at Chelmer. The potato crop was light, with a large proportion of small potatoes. As the machine, drawn by two medium plough horses, passed through the rows, it was seen that every potato was laid on the surface, which was left smooth and even behind it. The work was done so expeditiously that it was facetiously remarked that an army of pickers-up would be required to keep pace with it. Mr. Jackson claims that his machine will take up the crop from 6 acres a day, and those present thought it would even do more than this. It is the inventor's intention to form a small company to enable him to establish special works for building the machines and placing them on the market. Already an application has come from New Zealand for the agency for the machines, which, by the way, have been patented or, rather, protected in that colony and throughout the Commonwealth. With the advent of this digger, the labour of digging a potato crop is entirely done away with. It now only needs another machine to pick up and bag the potatoes to make the business a mere pastime.

ON PLOUGHING.

We are all familiar with the phrase, "A little farm well tilled." That short sentence describes the modest wish of everyone who launches into an agricultural career. Having got the "little farm," the wish expands into a "big farm," and, by keeping the "little farm" well tilled, the "big farm" may become an accomplished fact. Tillage in agriculture is a most important operation, its object being, of course, to bring the ground into that state of tilth best suited to the growth of grass and crops. In order to obtain this tilth, the employment of many kinds of implements are required, and the first of these is the plough. It is not now regarded as the most important, because the cultivators, grubbers, disc harrows, and similar implements reduce the ground to a proper condition for a seed bed, even if the ploughing has been badly done. There can be no doubt, however, that the plough is a very important machine in agriculture, and must continue to be so till the end of time. It is the most ancient implement known, but within the last century it has been improved very much indeed—in fact, there are few machines which have been more altered in its appearance and its work. Wood has been replaced by iron; steel has taken the place of iron; and mechanical laws have been applied to make the implement easier to pull and more effective in its work. As the years go on, new principles are being applied, and there are now quite a number of different kinds of ploughs on the market and in general use. There are the ordinary single and double furrow ploughs (swing ploughs are rarely seen nowadays), digging ploughs, subsoil ploughs, gang and stump-jumping ploughs, one-way or hillside ploughs, multiple ploughs, and, last of all, disc ploughs. Some of these, as their names denote, are special-purpose ploughs, and with these there is no necessity to deal in the present article.

Single-furrow ploughs are not used except on small holdings and in gardens. They are now fitted with wheels, which keep them steady and at a uniform depth. Swing ploughs are balanced by the ploughmen, and require more skill in their management than wheeled ploughs. Single-furrow ploughs are often used for opening lands or striking out, and also for finishing. They are also used for such work as potato-planting, although the double-furrow is also used.

The double-furrow plough has for a long time been the principal kind of plough used in New Zealand. It is now in some districts being superseded by the treble-furrow, which is in reality a double-furrow with another beam and mould-board attached. The principle is exactly the same. The idea of the extra furrow is to give the larger teams, which must be used in cultivating and drilling, sufficient work to do when ploughing. It is not so long ago that three and four horse teams were in vogue. Nowadays the five and six horse team is in more general use, because of the extra strength required to haul up-to-date cultivators, disc harrows, and drills. Then, again, digger and disc ploughs are being used very largely, and these demand larger teams than the old four-horse team.

A plough is, in reality, a combination of instruments fastened to a beam. The most important of these instruments are the coulter or skeith, the share or sock, the mould-board or breast, and the bridle. Other parts are added, according to the kind of plough desired, but usually there is a lever and a steering-rod. It is not necessary for me, I suppose, to describe the function of each of these parts. Before describing the different kinds of work done by several kinds of ploughs and the uses of each, I will give a few of the terms used in ploughing.

There are two principal methods of ploughing—viz., in lands, and round-and-round. The former method is used on flat land and on undulating downs, while the latter is used in steep localities.

With practice, a perfectly straight furrow may be maintained, and with a little patience almost any plough may be set to cut and throw all its furrows alike and evenly. The turning-points at the ends of the "lands" are called "headlands," and it is important that youths starting to plough should be taught to keep their furrows square with the headland, and the headlands themselves the same width right through. A plough cannot do good work unless it is kept in good order, and every ploughman should know how to keep his plough wheels packed and his skeiths running true. For skeiths, I find the "cones" the best kind of axle to use. Skeiths should not be used among stones, nor should they be used in frosty weather, as they are liable to get damaged very seriously. The ordinary double and treble furrow is mostly useful for ploughing in the autumn, when it has to be fallow through the winter for turnips or oats in the spring. Lea ploughed for wheat should be turned the round-and-round method. In this case it is a lazy man's method. It continually moves the land towards the fences, while denuding the finish in the middle of the paddocks of soil. This applies also, of course, to ploughing steep country round-and-round, but it is unavoidable in this instance. By ploughing in lands, good drainage may be effected; the land can be effectually cross-ploughed, and the land can be kept fairly even and level by altering the place for striking out and finishing. The crown of the land is the high ridge formed by marking out, or striking out, as it is usually called. This marking out is called "feeding." The open furrow between the lands is called the "finish." The furrows may be either gathered towards the crown of the land, or they may be scattered, till an open furrow or finish results. In gathering, the team pulls to the right; "gee-back" is the command given by the ploughman. In scattering, the horses turn to the left, or "come here," as their driver would

say. There are also several kinds of furrows, chief among which is the rectangular furrow, made by a flat-cutting share and an upright coulter or skeith; a high-cut furrow, obtained by using a share raised on the wing side, and a skeith or coulter, cutting a furrow at an angle. The digger plough has a furrow peculiarly its own, which I will attempt to describe later on.

I have said that the single-furrow plough is very frequently used for marking out and finishing lands. This operation may, however, be done equally well with a double or treble furrow plough; and there are very few who now trouble with a single furrow for marking out. Some prefer three horses for striking out with a double furrow, but it may be done, with practice, with any team. Now that the seed is usually drilled instead of being sown broadcast on the furrow, there is not so much used, from the utility point of view, for straight ploughing. Ploughing matches are going out of fashion, except in parts of South Canterbury and Southland, but it would be well if our agricultural and pastoral societies took the matter up.

Stubbles ploughed for autumn oats should be ploughed with an ordinary double-furrow or with one of the many kinds of multiple ploughs now being used. These multiple ploughs are principally useful for stubble work, and for turning over land out of turnips for either rape, grass, or oats. Oats are shallow-rooted, and therefore the digger may be reserved for the deeper-rooted wheat. Sometimes a mistake is made by ploughing too deeply for oats and for turnips. A dry season comes, and the roots fail to reach the subsoil. Had the land been ploughed fairly shallow, say 3 or 4 inches, the roots would have reached the stored-up moisture, and would have given a good crop. Moreover, being shallow-rooted, they get the benefit of animal droppings and decaying vegetation when the furrow is fairly shallow, and also of the work of soil bacteria, which are always more active near the surface than lower down in the soil.

I have mentioned digger ploughs several times, and will now endeavour to describe them and their functions. They are daily coming into more extended use, and in parts of Canterbury and Southland are thought very highly of indeed. Personally, I may say that some ten years ago I tried them, but was disappointed at the result, and gave them up. Some half-dozen years ago we had some very wet seasons, and I found that the digger would work where the ordinary plough would not. They left the ground in good condition for sowing grain on, and the crops did well. The secret of the whole matter was that the ploughs were being worked at too great a depth when they were previously being used. The breast or mould-board has a kind of shin on it which acts as a coulter. A skim coulter takes the place of the usual skeith or long coulter. This skim coulter assists in cutting the furrow, but most of the vertical cutting is done by the shin on the mould-board. The horizontal cutting is done by a broad share, which forms the forepart of the mould-board. The shape of the mould-board is different to that on the plain double furrow. It is much shorter, is slightly disked, and then takes an outside curve. The earth is thrown outwards and over, and is not compressed or packed. It is left in much the same condition as it would be if dug with a spade. The land lies loosely, and frost can get into it. The water runs through it, and there is no solid furrow to be worked down. As I have already indicated, the digger can be worked in stiff, clay soils in wet weather, when the plain plough would have to remain idle. It does a great amount of after cultivation. A stroke of the tines or discs before the drill, and a couple of strokes after, is all that is required, where in other cases scarifiers and rollers would have to be used. The digger buries grass and weeds deeply down, so that they do not get a chance to grow through the furrows. Moreover, the vegetation gets rotten about the time the ear of corn is filling, and helps materially to form food for the plant

at a time when it requires it. There is, as already stated, a danger of turning up too much sour land, so that the seed does not grow away quickly. This must, of course, be guarded against. The plough will plough no deeper than where it is set. I know of people who quickly discard the digger because they cannot make them do good work. The fault is, very often, that an attempt is being made to turn over a furrow too wide for the depth. The result is that the desired crumbling, feathery state of the land is not attained. As a rule, people do not, on clay lands, desire to plough deeper than 6 or 7 inches. Roughly speaking, 1 inch of depth requires 2 inches of width. Thus a furrow 6 inches deep should not have a greater width than 12 inches. A furrow 6 inches by 15 inches would be a failure, in my experience. In marking out, the front wheel should be lowered in order that the front plough shall not plough too deeply, and throw up too high a ridge. In finishing, much the same method is adopted as with an ordinary plough. It is well to repeat that the first time of ploughing must not be too deep. The soil on the top after ploughing is all brought up from the bottom of the furrow. A paddock may easily be spoiled for a year or two because of too deep ploughing with the digger. They are often spoken of as horse-killers, but, as a matter of fact, they are not more so than an ordinary plough. They certainly require more strength, but they will turn over 4 acres a day, where an ordinary plough will only do between 3 and $3\frac{1}{2}$ acres in the day. In ground where they have never been used before, the work is harder than on land where they are frequently used, because there is a certain amount of subsoil to be turned up for the first time. In ordinary cases five horses will work them as easily as four will work a plain plough, and, as I have said, they will do from $\frac{1}{2}$ -acre to 1 acre more work. The mould-board is shorter, but there is less friction, because it has only to clear its way, whereas a plain plough has to be dragged through the ground like a wedge.

I shall conclude by saying something about the latest pattern of plough—the disc plough. They are coming into use slowly, and are excellent for certain kinds of work on certain kinds of land. For cross-ploughing in autumn they do good work, breaking up the ground thoroughly, so that but little after-work is needed to make a good seed bed. They do well on stubbles in the autumn, and get over a lot of ground in a day. They are made somewhat on the principle of the disc harrow, and require more power than an ordinary plough. If they are set narrow, and the ground is level, four horses will work them on stubble, turnip land, or fallow, and five on lea land. Generally speaking, however, they require five horses for the former kind of land and six on the latter, especially if the ground is hilly. They are not suitable for turnip land which has been tramped and poached by stock in the winter, as they leave the ground too lumpy and rough. It is on the twitchy land that the disc plough is most serviceable. In fact, it will throw about land infested with couch, yarrow, and other plants with creeping roots in splendid style, where a plain furrow plough will scarcely touch it. Paddocks which have been given up as unworkable, by reason of a mat of twitch or couch, have been brought into cultivation again by the disc plough. It throws the furrows in the air, and leaves them lying up to the sun and weather in such a manner that the plants are half-killed before after cultivation is started upon. Moreover, the furrow, instead of being packed hard, so that no disc harrow or cultivator can touch it, is left so that these implements can smash them about splendidly. Some farmers break up twitchy land with the ordinary plough, and then put the disc plough on to cross-plough, with very satisfactory results. In my opinion, the disc plough is an implement that materially reduces the fear that twitch and couch, and such like weeds, will ultimately get possession of our arable lands.—A New Zealand Farmer, in "The New Zealand Farmer."

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

RECORD OF COWS FOR MONTH OF AUGUST, 1908.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Sue ...	Grade Shorthorn	25 May, 1908	799	5.0	44.74	
2	Peewee ...	Holstein-Sh'rth'rn	20 May "	932	4.0	41.75	
3	Grace ...	Shorthorn	30 May "	822	3.2	29.46	
4	Hetty ...	Ayrshire-Sh'rth'n	20 Mar. "	541	4.3	26.05	
5	Winnie ...	Shorthorn	8 April "	604	3.8	25.70	
6	Ruby ...	Ayrshire	21 July "	612	3.7	25.36	
7	Carrie ...	Jersey	16 Jan. "	518	4.3	24.94	
8	Remit ..	Grade Holstein	6 Aug. "	666	3.1	23.12	
9	Glen ...	Shorthorn	10 Feb. "	402	5.0	22.51	
10	Rhoda ...	Grade Shorthorn	28 Mar. "	540	3.7	22.37	
11	Lark ...	Ayrshire	6 June "	495	4.2	22.28	With first calf
12	Cocoa ...	Jersey	10 Nov., 1907	439	4.5	22.12	
13	Nettle ...	Shorthorn	14 May, 1908	583	3.3	21.54	
14	Lady Loch...	Ayrshire	21 June "	548	3.4	20.86	With first calf
15	Lubra ...	"	5 June "	519	3.7	20.50	" "
16	Madge ...	Grade Holstein	16 June "	434	4.0	19.44	" "
17	Mona ...	"	20 Oct., 1907	443	3.7	18.35	
18	Damsel ...	Holstein	19 Feb., 1908	462	3.5	18.11	
19	Lalla ...	"	28 July "	467	3.4	17.78	With first calf
20	Honeycomb	Shorthorn	23 Aug., 1907	334	4.7	17.58	
21	Nancy ..	"	7 May, 1908	473	3.3	17.48	With first calf
22	Nellie II. ...	"	"	422	3.5	16.54	
23	Patch ...	"	14 Sept., 1907	352	4.1	16.16	
24	College Lass	Ayrshire	14 Sept. "	320	4.3	15.41	

The cows were fed on ensilage, 40 lb. per day, and allowed to run in different poorly grassed paddocks.

TO MAKE SMALL CHEESE.

It is difficult to give necessary directions for successfully making cheese to one not accustomed to curd mixing, writes a practical cheese-maker in an exchange. Until an operator has gained experience by practice, the result of making cheese from such printed directions cannot be guaranteed. But some principles and rules may be given which ought to prove a fairly satisfactory guide to experimental practice, if good judgment be used in their application.

We will assume that we use 500 lb. of milk, testing 4 per cent. fat. If the quantity of milk used be more or less, the amount of rennet, salt, &c., should be proportionate. The night's milk should be well aired, cooled, and kept at a temperature of 65 degrees.

Mix the night's milk and the fresh morning's milk in a vat or tub not more than 20 inches deep; 15 inches will be better, as the curd will cook more thoroughly, and with less danger of packing in the bottom. A very simple and effective way of heating the milk is by using two small cans, 7 inches in

diameter, and high enough to extend above the surface of the milk. Fill these with hot water, and move them around in the vat until the milk is warmed to 84 degrees.

When coloured cheese is desired, add $\frac{1}{2}$ -oz. of some standard cheese colour mixed with a pint of water, and stir thoroughly into the milk. Put $1\frac{1}{2}$ oz. of rennet extract into half a pint of cold water; do not use warm water or allow the mixture to become warm, and add to the milk, stirring for two minutes. The mass will coagulate and be ready to cut in about twenty-five minutes. The curd is ready to cut when it will break clean over the finger. If no cheese knife is at hand, use a piece of galvanised woven-wire netting about 6 by 15 inches, with a $\frac{1}{2}$ -inch mesh, drawing it through the mass lengthwise and crosswise. This, of course, is a crude way of cutting, but it will serve the purpose of breaking the mass and starting the whey. Keep the mass stirred, so the small cubes will remain separate. The heating cans should be again used in ten minutes. Keep them moving around in the vat, and also move the curd well, in order to prevent any portion of the latter from becoming overheated. When the thermometer registers 98 degrees, take out the cans and stir the mass until the cubes do not readily adhere; then stir occasionally until ready for the mould.

This point is not easily determined. The old way of deciding this was to take off the whey when the curd squeaks between the teeth—by no means a bad method. It would be better to depend upon the feeling and the smell, but beginners may use the first rule mentioned, aided by the feeling. Take a handful of curd and squeeze it hard. If it has an elastic feeling, showing it to be dried out, then drain off the whey. Keep the curd well stirred until it is cool and free from moisture; this will require about half an hour.

It may be more convenient after removing the whey to place the curd in some other receptacle, where the moisture will drain out more easily and quickly—either a slanting rack or a rack with a cloth over it. Add 1 lb. of clean salt, thoroughly mix with curd, and wait fifteen minutes before pressing. Two hoops 11 inches in diameter and 14 inches deep, or one hoop 14 inches in diameter and 14 inches deep, will be needed; or, if small, 12-lb. cheeses are wanted, get four 7-inch hoops 12 inches deep. The amount of cheese produced will depend upon the fat content of the milk. It is safe to count on 2.65 lb. of cured cheese for each 1 lb. of fat in the milk, if the milk contains anywhere from $3\frac{1}{2}$ to $4\frac{1}{2}$ lb. butter fat.

Take a cheese bandage to fit the hoop and long enough to project 1 or 2 inches at each end. Place a round piece of cotton cloth at the bottom of the hoop as a temporary cap or cover; then put in the bandage with the lower edge turned in about 1 inch on the top of the bottom cap and the upper edge turned back over the top of the hoop. Fill in the curd, fold in the upper edge of the bandage, put on as a top cover a piece of cotton cloth similar to the one on the bottom, and place in the press. For pressing, use a $1\frac{1}{2}$ -inch screw set in a frame and provided with means for turning, if a better press is not available. The rind will not form and the whole operation will be a failure, if sufficient pressure is not applied.

After an hour take out of the press, adjust and smooth the bandage, covering the edges nicely, and put on cap cloths of same material as the bandage, with the cotton press cloths on the outside of these. Put the cheese back into the hoop with a strong, round, wooden follower closely fitting inside the hoop on top of the cheese, and press again the following day. Then take out the cheese, remove the press cloths, and place it for curing on a shelf in a room having an even temperature of about 60 degrees. It should cure in three or four weeks. The resulting cheese will be presentable and eatable, if no gross errors occur in the making.—Exchange.

BUTTER FACTORIES IN QUEENSLAND, 1908.

District.	Name of Factory or Company.	Proprietary or Co-operative.
Brisbane and East Moreton	Lowood Creamery Company, Limited, Adelaide street; and at Beau Desert	Proprietary
"	Brisbane Butter and Ice Company, South Brisbane	"
"	Silverwood Dairy Factory Company, Limited, Roma street, Brisbane; and at Terror's Creek	"
"	Queensland Meat Export and Agency Company, Pinkenba	"
"	South Queensland Co-operative Dairy Company, Limited, Kingston	Co-operative
"	Logan and Albert Co-operative Dairy Company, Beaudesert	"
"	Caboolture Co-operative Dairy Company, Limited, Caboolture	"
"	Stanley River Co-operative Company, Limited, Yatesville	"
"	Maleny Co-operative Dairy Company, Limited, Maleny, <i>via</i> Landsborough	"
"	C. E. Springall, Stanley street, South Brisbane	Proprietary
Ipswich and West Moreton	F. G. Springall, North Ipswich	"
"	Pommer Bros.	"
"	F. W. Linning, Kirchheim	"
"	J. L. Frederich, Marburg	"
"	Siemon and Sons, Walloon	"
"	Dick Bros., Purga	"
"	Patrick Sherlock, Pine Mountain	"
"	Queensland Farmers' Co-operative Company, Limited; Factories at Booval, Laidley, Grantham, and Boonah	Co-operative
"	Silverwood Dairy Factory Company, Gatton	Proprietary
"	Esk Co-operative Dairy Company, Limited, Esk	Co-operative
Darling Downs	Silverwood Dairy Factory Company, Limited; Factories at Toowoomba and Warwick	Proprietary
"	The Downs Co-operative Dairy Company, Limited, Toowoomba	Co-operative
"	Crow's Nest Dairy Company, Limited, Crow's Nest	"
"	Goombungee Co-operative Dairy Company, Limited, Goombungee	"
"	Pittsworth Dairy Company, Limited, Pittsworth	"
"	Oakey Dairying Company, Limited, Oakey	"
"	Mount Bismarck Co-operative Dairy Company, Mount Bismarck	"
"	Pilton Dairying Company, Limited, Upper Pilton, Clifton	"
"	Clifton Co-operative Dairying Company, Limited, Clifton	"
"	Warwick Butter and Dairying Company, Limited; Factories at Warwick and Allora	"
"	Dalby Butter Factory, Dalby	Proprietary
Maranoa	Macfarlane and O'Connor, Roma	"
Wide Bay and Burnett	Wide Bay Co-operative Dairy Company, Limited, Gympie	Co-operative
"	Tiaro Co-operative Dairy Company, Limited, Tiaro	"
"	Maryborough Co-operative Dairy Company, Limited; Factories at Maryborough and Kingaroy	"
"	Nanango Co-operative Dairy Company, Limited, Nanango	"
"	Bundaberg Co-operative Dairy Company, Limited, Bundaberg	"
Rockhampton	Port Curtis Co-operative Dairy Company, Limited, Gladstone	"
"	Rockhampton District Co-operative Dairy Company, Rockhampton	"
"	Archer Bros., Gracemere, Rockhampton	Proprietary
"	Conaghan Bros., Rockhampton	"
"	C.Q. Meat Export Company, Lake's Creek, Rockhampton	"
North Queensland	Ayr Co-operative Dairy Company, Limited, Ayr	Co-operative
"	Cairns-Atherton Dairying and Ice Company, Cairns	Proprietary

CONDENSED MILK FACTORIES.

Nestle and Anglo-Swiss Condensed Milk Company.—Factories at Toogoolawah, Esk; Trelawny, Harrisville.

Standard Dairy Company, Wyreema and Colinton.

Gowrie Dairy Supplies, Gowrie.

CHEESE FACTORIES.

Silverwood Dairy Factory Company, Limited; head office, Roma street, Brisbane. Factories at—Yangan; Tannymorel; Milmerran, *viâ* Pittsworth; Forest Plain, *viâ* Allora; Lord John Swamp, *viâ* Warwick.

Lowood Creamery Company, Limited; head office, Adelaide street, Brisbane. Factories at—Elbow Valley, *viâ* Warwick; Greymare, *viâ* Warwick; Yangan; Inglewood

Donald McIntyre, Goombungee. Factories at Goombungee and Mount Darry, *viâ* Goombungee.

Greenmount Co-operative Dairy Company, Limited, Greenmount.

Ramsay Co-operative Dairy Company, Limited, Cambooya.

Back Plains Co-operative Dairy Company, Limited, Back Plains, Clifton.

Pittsworth Co-operative Dairy Company, Limited, Pittsworth.

Donald Mackintosh, Glencairn, *viâ* Pittsworth.

IXL Dairy Company, Eton Vale, *viâ* Greenmount.

Southbrook Co-operative Dairy Company, Limited, Southbrook.

Daly Bros., Quinalow, *viâ* Jondaryan

Rosevale Cheese Factory, Rosevale, *viâ* Rosewood.

MEAT EXPORTING FACTORIES.

Brown and Company, Elizabeth street.

Queensland Meat Export and Agency Company, Limited. Factories at—Pinkenba, Townsville, Burketown.

Baynes Bros., South Brisbane (Factory at Queensport).

Birt and Company, Limited, Mooraree, near Brisbane.

John Cooke and Company, Redbank Freezing Works, Redbank, near Brisbane.

Gladstone Meat Works of Queensland, Gladstone.

Central Queensland Meat Export Company, Lake's Creek, Rockhampton.

Bergl Australia, Limited, Merinda, Bowen.

North Queensland Meat Export Company, Limited, Townsville.

Burdekin River Meat-preserving Company, Limited, Townsville.

BACON FACTORIES.

J. C. Hutton Proprietary, Limited, Zillmere (Brisbane office, Roma street, Brisbane).

Foggitt, Jones, and Company, Oxley (Brisbane office, Turbot street, Brisbane).

Chapman and Sons, Murphy's Creek.

Krimmer and Reid, Toowoomba.

Queensland Meat Export and Agency Company, Limited, Pinkenba.

GUERNSEY CATTLE.

Whilst volumes are written in Queensland journals on the Ayrshire, Jersey, Shorthorn, and Holstein breeds of dairy stock, little is heard of the Guernsey; yet these latter closely resemble the Jerseys in their general conformation and appearance. Still, this breed has never enjoyed, throughout Australia, the same popularity as the others above mentioned. A few years ago the Government of New South Wales introduced some bulls and cows of this breed into that State; and a strong demand set in by farmers, desirous of improving their dairy herds, for Guernsey bulls, and, for a time, their introduction met with marked success. Last year a number of Guernseys were imported into New South Wales from England. They were rich strains of butter-producing stock, with pedigrees from herds which had been bred for years for milk and butter.

The breed originated in another of the Channel Islands known as the Island of Guernsey, and has practically the same origin and history as the Jersey. In the development of the Guernseys, however, more of the original characteristics of the parent stock from Normandy have been preserved. At present, however, the Guernseys closely resemble the Jerseys in their general conformation and appearance.

The Guernseys were first introduced into the United States, in numbers, in about 1850, being grouped together with the Jerseys at that time under the name of "Alderneys." Between 1870 and 1875 the Guernsey was recognised as a distinct breed in the United States. The head of the Guernsey is long, the neck slender, the body large and deep, and the flanks thin. The colour is light-yellow and orange or buff predominating, with considerable white in patches on the body and legs. Dark colours approaching brown are seen on some cows and more frequently on bulls. The muzzle is most always buff or flesh colour. The horns are small, curved, and waxy, often showing a rich yellow at the base. One of the distinguishing characteristics of the Guernsey is the large secretion of yellow colouring matter throughout the skin, but especially where the hair is white around the ears, eyes, and udder. The udder and teats are well shaped. While the Guernsey is of a nervous temperament, the cows are gentle under proper management, and the bulls are probably less likely to become vicious than Jersey bulls.

The Guernseys are economic feeders and excellent butter-producers, the milk often showing from 5 to 6 per cent. of fat. They are especially recommended by Alvord and others for butter cows and for the production of market milk, where quality secures a high price. They show great power of assimilating feed. At the butter tests and milking trials at the Royal Counties Show, Southampton, England, in June last, one Guernsey cow, eight Jerseys, two Lincoln Reds, and two Shorthorns were entered for the butter test, with the following results:—

The animals were milked out at 5 p.m. on Thursday, 24th June, and the milk of the next twenty-four hours taken for the test at 7 a.m., and again at 5 p.m., after which the milk was separated.

Churning commenced on Saturday, at 6.50 a.m., and was concluded at 9.13, the awards being made known at 10.30 a.m. The butters were of high merit.

The prizes were awarded as follow:—First prize, £10, and gold medal to the Marquis of Winchester's Wench, 47.50 points; silver medal to Mr. J. Carson's Mary's Beauty, 36.95 points; bronze medal to Mr. J. Carson's Blue Poppy, 35.20 points; second prize, £7, to Mr. Dampney's Shorthorn cow Lady, 45.00 points; third prize, £3, to Mr. Williams' Shorthorn cow Bessie, 37.75 points. Mr. Carson's Blue Poppy was awarded the £1 butter prize for the best butter in the test.

The averages are as follows:—

No.	Breed.	Days in Milk.	Milk.	Butter.	Ratio.	Points.
			Lb. oz.	Lb. oz.	Lb.	
8	Jerseys	107	31 2 ³ / ₄	1 11 ¹ / ₂	18·11	34·01
2	Shorthorns	21	65 7	2 9 ¹ / ₄	22·28	41·37
2	Lincoln Reds	57	59 14	2 0	29·82	34·72
1	Guernsey	8	38 14	2 1 ¹ / ₂	18·56	33 50

MILK YIELD TEST.

Eleven animals were entered for the above trials; two were absent; so that nine actually competed. Of these, three were Jerseys, three Shorthorns, two Lincoln Reds, and one Guernsey.

The twenty-four hours' milk was taken, and small samples extracted morning and evening, by the Gerber process, for the purpose of ascertaining the amount of butter fat.

The first prize was won by Lord Rothschild's Shorthorn cow, Darlington Cranford 5th, with 89·45 points; Mr. Evens' Lincoln Red, Burton Milker, second; with 82·85 points; and Mr. Dampney's Shorthorn cow, Lady, third, with 80·90 points. The remaining animals competing all passed the standard, and were awarded commended cards. The averages of the breeds are as follow:—

No.	Breed.	Days in Milk.	Milk Yield.	Butter Fat.	Points.
			Lb. oz.		
3	Shorthorns	33	67 14	3·76	83·50
3	Jerseys	113	33 6	5·40	62·27
2	Lincoln Reds	57	59 14	3·27	75·57
1	Guernsey	8	38 14	4·80	58·07

THE QUEENSLAND BEE-KEEPERS' ASSOCIATION.

The following has been received from the hon. seceretary of the above association:—

“The members of the Queensland Bee-keepers' Association wish to tender to Mr. A. H. Benson, the Queensland Fruit Expert, their hearty thanks and appreciation for the valuable services rendered by him to the bee-keepers of Queensland at the Congress of Bee-keepers, recently held in England. In Mr. Benson the bee-keepers of this State have always had a sympathetic advocate, and, although not a practical bee-keeper, he has always recognised the importance of the bee in connection with the fruit industry.”

Mr. J. M. Mitchell, Toowong, reports:—“There is a lively hum going on in my apiary that has been non-existent for a long time. The ironbarks are blooming freely, and the bees are bringing in a nice little flow of honey; while the queens are laying heavily. The brood frames are great cakes of brood, indicating rousing strong colonies of workers in a few weeks, capable of bringing in a large store quickly. The honey yield here was a total failure last season; and it is hoped—and present indications point to the probability—the trees will bloom in profusion this year, so that a good crop will be obtained.”

Mr. G. Butler, Waterworks road, states:—“The bees are looking better than they have done for some time, and from present indications there will be an early flow. The grey gums and ironbarks are full of bud and bloom. The bees are working with a will, and the hopes of the bee-keeper are reviving.”

The Editor will be glad to receive and publish any information concerning bee-culture in Queensland, from the Queensland Bee-keepers' Association.

The Horse.

CARE OF HORSES' HOOFS.

The most important point requiring attention in regard to the proper management of horses' feet is to see that the frog remains in a well-developed and healthy condition. Owing to the comparative obscurity of this organ of the foot, it receives but little or no intelligent attention from most horse-owners or their grooms. The only man who pays any attention to it, as a rule, is the blacksmith, and he is the very person who ought not to do so, as his attention is more often than not the reverse of intelligent, and does a lot of harm. Many farriers seem to think that the frog in the horse's foot exists for their special benefit, so that they may cut away parts of it. The fact that it is composed of horn, which is very easy to cut with the drawing knife, appears to be regarded by some of them as a good reason for mutilating it when shoeing a horse. The healthy frog in an unshod horse is always a prominent and well-developed, and it stands to reason that it must be quite wrong to reduce its size by paring away slices of the horn, because, if its presence in the foot were superfluous, we may be sure it would not be there. The first thing a horse-owner should do, if he wishes to care for his horses' feet in an intelligent manner, is to instruct his farrier not to mutilate the frogs, but to keep his hands off them. The orders in this respect should be absolutely peremptory, as it is difficult to induce some blacksmiths to leave the frog alone.

Next to the farrier's drawing knife, thrush is a great source of shrunken and small frogs. The prevention of this diseased condition of the foot is one of the main features in the practical management of the feet. The bedding must be kept clean and dry, as dirty litter, saturated with urine, generally induces thrush, if a horse stands on such for a continued period of time. The application of Stockholm tar to the cleft of the frog is a very good means of preventing the appearance of thrush, and this measure should be carried out once a week, while bi-weekly applications would be none too many.

It is especially necessary to keep the cleft of the frog free from particles of manure, because it is often a cause of thrush, unless continually dislodged. Manure has a decomposing action on horn, and more especially so in the case of the horn composing the outer frog, because the latter is of soft texture.

Though most attention is usually bestowed on the outside wall of the hoofs, this part of the foot really requires but little care, so far as the management of the feet is concerned. The principal point is to instruct the shoeing smiths not to apply the rasp to the outer wall, most farriers being just as fond of rasping the surface of the wall as paring the frog. If one examines the feet of horses that have not had the wall rasped at the forge, it will be seen that the surface of the wall is more or less shiny, and covered with a thin layer of gelatinous substance. This layer forms the natural protection of the horn of the wall against the softening influence of moisture, and it also to some extent prevents the horn from getting brittle. If the rasp is applied, the layer is destroyed, and the wall then readily suffers from the effects of too much moisture, or becomes brittle. The keeping intact of the gelatinous layer on the surface of the wall is certainly much more to the point than the application of some oily or fatty substance. Though it does not harm to apply the latter to the feet, the benefit accruing from it is problematically more imaginary than real.

Much moisture always has a softening effect on the horn of the hoofs, while dryness increases the hardness and toughness. Consequently the feet

of horses are generally softer during a spell of wet weather than when the weather is dry. Those having experience of riding unshod horses contend that unshod feet wear better in a dry season than in a wet one.

The comparative softness or toughness of horses' feet, however, depends not so much on external influences as upon the natural texture of the horny hoofs of each individual horse. Some horses have naturally much tougher feet than others, and if a horse has very soft or brittle hoofs these cannot be turned into tough ones by any artificial means.

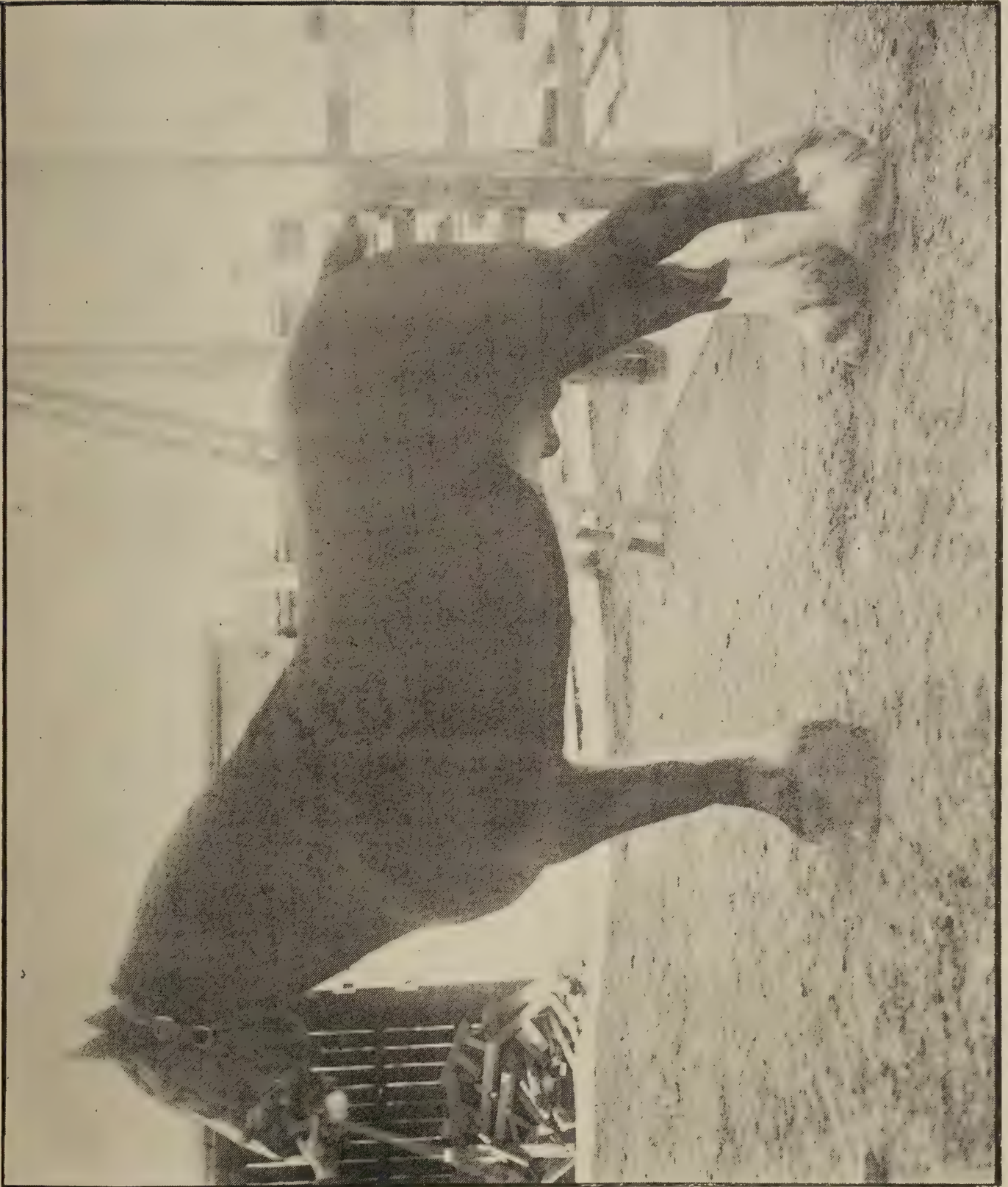
IMPORTED STALLION KING EDWARD.

In August last there arrived in Brisbane from New Zealand the Clydesdale stallion King Edward, which has been purchased by the Department of Agriculture and Stock for use at the Warren State Farm, near Stanwell, in the Rockhampton district. The horse is rising three years old, having been foaled on 9th November, 1905. He is dark bay in colour, with two white hind legs and a white blaze down his face. As a yearling, King Edward took second prize at Invercargill show, and he was third the following year as a two-year-old. He is by the imported horse Bancor. Bancor's sire was King of Kyle (10200 C.S.B.), 1st dam Jess of Hawhill, by Columbia (6621), 2nd dam, bred by Mr. Caldwell, by Lyon Waterloo (2266); King of Kyle, by Prince of Kyle, by Prince of Wales. Bancor gained Selkirk and Galashiels premium as a three-year-old; as a two-year-old was placed at the Glasgow Stallion Show and the Highland, held at Aberdeen; won first prize at the show at Dumfriesshire, was first and champion at Tapanui a few weeks after landing in New Zealand, and was first and champion at Palmerston in 1906. He was sold to go to the North Island for nearly 900 guineas. King Edward's dam was Darling (780 N.Z.S.B.), her sire Macarthur (330 N.Z.S.B.), Macarthur's sire Macbride (2987 S.S.B.), Darling's dam Jean (774 N.Z.S.B.), her sire Extinguisher (174 N.Z.S.B.), g.g.g. dam Bess (775 N.Z.S.B.), her sire Darnley (104 N.Z.S.B.), his sire Young Banker.

RAISIN-MAKING.

All grapes for raisin-making should be dead ripe, as three or four days make a great difference in the amount of sugar in the grapes, and consequently in the quality of the raisins. All grapes do not ripen at the same time; therefore, the experienced grower will pick over the vineyard several times, each time picking only the ripened grapes. Each bunch must then be cleaned, every sunburnt berry and all foreign matter being removed. Then they are placed on trays, and the grapes are gradually dried by the sun. The best temperature is from 90 to 103 degrees in the shade. A much higher temperature will not injure very ripe grapes. When the heat is such that the raisins would cook and spoil, the trays should be stacked to protect the fruit until the heat has become less intense. After a few days' exposure to the sun in the vineyard, the grapes must be turned, as the grapes exposed to the sun will have dried, whilst those underneath are still green. The turning should not be done until the upper berries have quite dried, and the morning hours should be chosen for the work. The trays of dried fruit have next to be stacked. After remaining in the stack for some days, the raisins are placed in sweat boxes, 6 to 8 inches deep, for a couple of weeks, and are then ready for packing. It takes about 3 tons of grapes to make 1 ton of raisins.

Plate XXVII.



IMPORTED STALLION, KING EDWARD

Poultry.

FOWL CHOLERA.

The Board of Agriculture and Fisheries, London, has issued the following leaflet on the subject of fowl cholera:—

Fowl cholera is a highly infectious disease, which, though comparatively rare in this country, has caused serious loss to poultry-keepers on the Continent of Europe, in North America, and in South Africa. It frequently assumes an epidemic form, and in such cases often more than half the stock have succumbed. The disease affects not only fowls, as its name implies, but also geese, ducks, pigeons, pheasants, and some wild birds, such as sparrows and finches. Rabbits can be inoculated with the disease, but the larger domestic animals are not susceptible to the complaint.

The cause of the disease is a microbe, a minute ovoid bacillus, which is found in the blood, organs, and contents of the intestines of the infected animals. It passes into their droppings, and so is taken up in the food or drinking water of the healthy birds. Occasionally the disease is introduced into a flock by the purchase of infected birds, by infection picked up at poultry shows, or by birds being put into contaminated crates belonging to dealers or other persons. The microbe, however, is very easily destroyed by a weak solution of carbolic acid or sulphuric acid. It also dies after an exposure to sun and air.

Symptoms.—The period of incubation is very short, in some cases not more than eight hours, while it rarely exceeds sixteen. Fowls that have pecked the dead body of a comrade have been known to develop the disease in twenty-four hours. The disease takes two forms—the acute and the chronic. In the first case, the course of the illness is very rapid, and it frequently happens that no symptoms are observed, the bird dying before it is noticed as being ill. It may collapse in its walk, or fall from its perch to the ground and die, after giving a few flaps of its wings. But the symptoms when they are noticeable are as follows:—Affected birds become depressed, huddle themselves together, and hide their heads under their wings. The feathers become ruffled, the wings and tail droop, and the birds sway from side to side or stagger. The appetite is lessened, while thirst is greatly increased. There is a discharge from the eyes, nose, and beak, and the comb and wattles turn bluish-red. The most marked symptom, however, is diarrhoea. The evacuations are frequent and watery, being white or yellow at first and becoming greenish and foetid as the disease progresses, while the feathers round the hind parts become matted together. Except in the specially acute form mentioned above, the disease lasts from one to three days, though cases are on record where the illness was prolonged for a week. The birds usually die in a state of stupor or convulsions. The death rate in acute cases is very high, sometimes reaching even 80 or 90 per cent.

In the chronic form the more violent symptoms are not present, but the bird becomes thin and bloodless, and suffers from constant diarrhoea. Sometimes there is a breaking out on one or more of the joints, and the inflammation then set up naturally retards the recovery of the sick bird. Towards the end of an epidemic, however, milder cases occur, among which there are a greater number of recoveries. Birds which get well acquire a certain amount of immunity, and if they thrive are valuable for restocking purposes.

Appearance after Death.—In ordinary cases the only marks visible to the naked eye will be found in the intestinal tract, the contents of which are watery, frothy, and sometimes bloodstained. In the intestinal wall, and particularly in the mucous membrane, are formed patches of clotted blood and areas

of congestion ranging in colour from red to purple and black. The liver and spleen are usually enlarged, while in some cases the lungs are consolidated. In some places the mucous membrane may be destroyed, and in others patches of yellow exudate may be found. It must be remembered, however, that there are other poultry diseases with which it can easily be confused by the inexperienced, and that in certain cases a microscopical examination is necessary.

Precautions.

1. All newly purchased birds should be isolated for a day, and the same course should be adopted in the case of birds returning from a poultry show.

2. Crates and packing material should always be disinfected, and care should be taken to secure an uncontaminated supply of food and drinking water.

3. When the disease appears, all infected birds should be strictly isolated, and healthy ones should be moved to fresh ground. The infected runs and pens should be sprayed with a disinfectant, such as a 5 per cent. solution of carbolic acid or 2 per cent. of commercial sulphuric acid in water.

Remedy.

There is no practical medical treatment which can be advised for diseased birds. A protective serum is in use on the Continent, but the small value of poultry renders the extensive use of this remedy too costly, except, perhaps, in the case of valuable pedigree birds.

AMOUNT OF SEEDS REQUIRED PER ACRE.

Amongst the many new settlers on the land in this State, there are probably some who have entered on the business of farming without much, if any, previous experience; and it may be of advantage to these to know how much seed to purchase for sowing or planting various crops.

Although there are certain crops which may practically be sown and raised all the year round in this favoured climate, yet the regular seasons for most crops are as clearly defined as they are in hotter, colder, or similar climates throughout the world. Allowance has, however, to be made in the times of sowing and the amount of seed needed, owing to the wide range of temperature, the difference in rainfall, and the variety of soils and their aspect in different parts of the State; but, as a general rule, the following quantities of various seeds required per acre will be found fairly correct:—

Barley, broadcast, 1 bushel to $1\frac{1}{2}$ bushel; drilled, $\frac{1}{2}$ -bushel. Beans (broad), drilled, $1\frac{1}{2}$ bushel; French beans, $1\frac{1}{2}$ bushel. Horse beans, 2 bushels. Beet, drilled, 5 lb. Buck Wheat, broadcast, 1 bushel to 2 bushels. Cabbage (field), in seed beds, 2 lb. Carrots, drilled, 5 lb. to 7 lb. Clover, broadcast, 12 lb. to 20 lb. Grasses: Prairie, 1 bushel; Italian rye, 4 bushels; perennial rye, 2 bushels; couch, $\frac{1}{2}$ -bushel; permanent mixed pasture, 3 bushels; imphee, 20 lb. Kohl-rabi, drilled, $2\frac{1}{2}$ lb. Lucerne, broadcast, 20 lb.; drilled, 10 lb. Maize, broadcast for fodder, 3 bushels; drilled for grain, $\frac{1}{2}$ -bushel. Mangolds, drilled, 5 lb. to 6 lb. Millet, broadcast, 1 bushel. Oats, broadcast, 2 bushels. Onions, broadcast, 5 lb.; drilled for setts, 20 lb. Panicum, broadcast, 20 lb. Parsnips, drilled, 8 lb. to 10 lb. Peas, broadcast, $2\frac{1}{2}$ bushels; drilled, 2 bushels. Potatoes, cut setts, 14 cwt.; whole, 10 cwt. Rye for grain, broadcast, $\frac{3}{4}$ -bushel. Sorghum for grain, in drills, 10 lb.; broadcast for green fodder or ensilage, 20 lb. Swedes, 3 lb. to 4 lb. Turnips, globe and yellow, drilled, 2 lb. Vetches, broadcast, 3 bushels. Wheat, broadcast, 1 bushel to $1\frac{1}{2}$ bushel; drilled, $\frac{1}{4}$ -bushel. Paddy (rice), 30 lb. to 40 lb. Cowpeas, 8 lb. Jerusalem artichokes, 3 cwt. to 4 cwt. Paspalum, 2 bushels to 3 bushels. (Paspalum seed weighs 140 lb. per cornsack). A good stand of Paspalum will result from sowing from 10 lb. to 15 lb. of seed per acre.

The Orchard.

THE BREEDING-PLACE OF THE CODLIN MOTH.

A writer in the "Fruit World" points out that apple-growers have been on the wrong scent for the codlin moth when they look for the worms in the orchard. He says:—

LOOK TO YOUR FRUIT HOUSES.

If one were to tell the apple-growers of California that they are in the habit of providing nice, comfortable breeding-places for their old enemy, the codlin moth, where it can pass the winter in safety, secure from the attacks of all its enemies, and be ready to come forth in the spring to commence anew the ravages upon their orchards, the statement would probably be received with incredulity or with a pitying smile for the ignorance of the adviser. And yet the statment is true.

For many years the orchardists of California have been spraying their apple-trees several times a year, in the endeavour to rid themselves of this pest (says the "Californian Fruitgrower"). Tree by tree they have gone over their orchards carefully, trying, at heavy expense, to lessen the numbers of the codlin moth. And what has been the result? Are not the insects practically as numerous now as they have been at any time? Some rare years it may seem as if success had to some extent crowned the efforts of the fruit-grower; the pest appears on the point of being defeated. But the next year it is back in full force, as bad as ever.

In spite of many years of experience, the apple-growers of California still have the idea that the codlin moth winters in the orchard. It does not altogether. Let any grower go into his orchard at this time of year, and see how many codlin moth worms he can find in the course of a whole day's search. If he finds ten, he will be doing well. The statement seems incredible, but it is easy to test the truth of it.

A little while ago two men interested in the subject visited one of the largest apple orchards in the State, an old orchard which is usually overrun with codlin moth. They devoted the entire day to a search for codlin moth. They twisted old bark off the trees, dug into likely-looking places, even tore down some old trees, and examined every part of them carefully. During the entire day they found six worms.

In this same orchard last year were liberated a colony of the new parasites which George Compere brought from Spain. Several months later these parasites were flying about the orchard by hundreds. Last week there was not one to be found. They had been starved out.

But where, then, is the codlin moth? Has it been destroyed?

These two men went into the packing-house and began an investigation of conditions there. Few signs of the moth were to be seen. Finally, someone suggested going into the cellar. There the solution of the question was found. There was a 3-inch interval between the edge of the flooring and side walls. On the under side of the flooring, extending back for several feet, was a solid mass of codlin moth chrysalids—thousands of them. The worms had dropped from the tables to the floor, and hurried away from the light to the edge of the floor, where they had crept down to the under side and pupated.

Here, then, was the supply of codlin moth for the coming season. When the time comes, they will emerge from the chrysalids as moths, and hasten away to the orchard to become the parents of the countless hordes of codlin moth worms which will attack the apple crop—and for which the grower will spray several times during the season.

This is not an exceptional case. It is merely an example of conditions which may be found in practically every apple packing-house. The worms at this time of the year are not so much in the orchard as in the packing-houses. The few that winter in the trees are a negligible quantity. Their natural enemies will take care of them—beetles, woodpeckers, &c. Those in the packing-houses are the ones that need particular attention.

At a minimum expenditure of labour and money, the apple-grower can practically destroy all the codlin moth, and—provided his neighbours do the same—render himself secure from their attacks during the coming season. He has the moths coralled in one place. All he has to do is to destroy them.

And the method is not difficult. Most of the packing-houses are built tightly enough, so that they can be closed up and fumigated. Close the doors and windows, and stop up any cracks that may be found. In the case of the smaller buildings, if necessary, spread a tent or other covering over them. Then fumigate thoroughly with cyanide. That will entirely destroy all the moths, except such as have bored their way into the boxes, &c. Boil the boxes. This is not a difficult operation. Practically all packing-houses have vats for mixing sprays. Boil the boxes in these.

QUEENSLAND FRUITS IN LONDON.

A report has been received by the Under Secretary for Agriculture and Stock, from Mr. A. H. Benson, Fruit Expert to the Department, on the present condition and possibilities of the London fruit market as it concerns Queensland fruits. He writes—

“As we can get Queensland citrus fruit into the English market now, I have been making inquiries as to the price likely to be obtained, the class of fruit required, how it is to be packed, and any other matters of interest to our growers. In the first place, there is a market now for first-class fruit, and, as the heavy supplies of European and home-grown plums fall off, the demand will improve. The best months for our citrus fruits here are August and September, though there is a good market for high-class navels and possibly high-class mandarins during June and July as well. Only first-class fruit is wanted. It must be clean and bright, with fine thin skins (no rough-skinned fruit will pay to send, and no russy fruit, ‘Maori’). The best fruit on the market now is oranges from Jamaica. They are seedlings, round, of about 2 inches in diameter, light yellow colour, and thin skins, and are very like the fruit grown at Cardwell, Bowen, and Port Douglas. The skins are finer than the bulk of the Maryborough and Blackall Range fruit, and very much finer than those of the Lockyer and Downs. Western grown fruit, such as the navels produced at Barcaldine, will fetch fancy prices here. Good seedling fruit such as I have described will fetch now about 14s. per bushel case containing about 112 oranges. The trade is very emphatic as to our sending nothing but the very best fruit, and from what I can see of the market I quite agree with them. No fruit must be exported from Queensland here unless it is up to standard quality, as the sending home of inferior goods will simply ruin this market. The whole world is catering for this country, and the buyers want the best that the world can produce. It is no good for our growers to ignore this fact, and, should they send other than the best, they will, in the majority of cases, be badly left.

“As to packing, the fruit must be wrapped, glazed paper or thin waxed paper being used. It must be thoroughly sweated before it is packed, and it must be packed so firmly that it will not roll about in the case, but not so firmly as to crush the fruit all out of shape. The size or shape of the case is immaterial, the fine appearance and quality of the fruit determining its value.

Mandarins from South Africa are on the market, and are selling at a very satisfactory price. They are of the scarlet type, of medium size and good colour, and have fairly tight skins. They are packed in fancy trays holding one layer of fruit, and five of these trays are bound together with thin hoop iron. There are no cleats between the trays, but these would be necessary in sending from Queensland. Each fruit is wrapped in fine paper, and each wrapper carries the brand of the shipper. This is advisable, as stencilled wrappers are better than plain. Good Emperor Scarlet or Beauty of Glen Retreat mandarins packed in this manner should carry all right and sell well. This information is practically the same that I have given our growers ever since I have been in the service of the Queensland Government, and simply bears out the soundness of the advice I have given. The method of packing the mandarins, which is, by the way, quite new here, is what I have recommended over and over again. As to pineapples, the market is bare now, and only medium fruit is worth 3s. 6d. each. Bananas are in good supply, and the price is lower owing to the quantity of summer fruit in the market. Cavendish bananas come from the Canary Islands in the bunch, each bunch being packed in a separate crate. Great care is taken in packing. The bunch has first a thin layer of cotton wool round it. It is then wrapped in paper, and outside the paper is a thick layer of straw or dry banana leaves. The fruit arrives here in the green state, and is ripened by artificial heat. These bananas sell usually at 1s. a dozen, but can be bought now eighteen for 1s. They are of fair flavour and medium size. They are, as a rule, better filled than the North Queensland fruit, but are not equal to the best Buderim Mountain. The bulk of the cheaper bananas comes from Jamaica. They are of the Gross St. Michael variety that sells so well in Sydney. The fruit is of large size, showy, and many of the bunches are very large. Though a much larger and more showy fruit than the cavendish, it is not equal to it in flavour, and as a result only fetches about half as much as the latter, thus reversing the market in Sydney, where this inferior kind fetches the highest price on account of its showy appearance.

"Grapes are plentiful, both hothouse and early ripening grapes from Spain. The latter are packed in cork dust, and arrive in good order. Pears are coming in freely from France, and both Bartlets and Beune Hardy are to hand from California. Plums, both local and European, are in large quantities, and extra fine. Kelsey Japan, Washington, and Yellow Egg, from California, are shown. Melons, both yellow and cantaloupe, are to hand in quantity. The yellow is a Spanish fruit that keeps and carries well. It is sold at a cheap rate, and, though not of the best flavour, it may possibly pay to grow in Queensland for shipping South, as it is the best keeper and shipper I have seen. I will get seed for testing in our State. The cantaloupes are of large size and fair quality. They are a rather different type from what we grow, and I will get seed. They come from Southern Europe, and are carefully packed in large crates. Wood wool is used for packing. Netted or rock melons are hot-house grown, and fetch high prices. Tomatoes are both good and plentiful. They are sold in peck baskets holding 12 lb. net, and are fetching now about 2s. 3d. per basket. They retail at 4d. per lb. The type of fruit that sells best is a small to medium tomato with a dark-red skin, smooth, round, firm flesh, and a good shipper. Cucumbers are plentiful, as well as vegetables of all kinds. One thing that strikes me is the great improvement in the packing of fruit and vegetables that has taken place during recent years, the object being to get all kinds on to the market in the pink of condition. Baskets, both peck, half bushel, and bushel, are still used to a very large extent, but cases of all sorts, crates, &c., are now much more commonly used than they were a few years since.

"In regard to apples, the local fruit is coming in—some very bad with fusicladium, and some excellent Canadian apples of last year's crop are still on

sale. Newtown pippins from Oregon that have been kept in cool storage are also still in splendid order, but in my opinion it is doubtful if it will pay to keep them so long, as they cannot compete with the new season's fruit, not coming in in quantity and rapidly improving in quality. I hope to go much further into fruit matters, and to look up our markets for canned goods, &c., and trust that I will be able to get hold of information that will be of real value to our State.

"With respect to other matters, I have made numerous inquiries regarding fibre plants and fibre-extracting machinery. I have also found out what I can regarding oil and oil-yielding plants, and have gone carefully into the question of date culture. I have met the Tunisian representative at the Franco-British Exhibition, and have arranged to exchange products with him, as I can obtain some of the best dates in the world from the Oasis to the south of Tunis, and hope to get suckers off bearing palms from there. Tunis grows good Algerian oats, fair barleys of the Cape type, a large-seeded linseed, and some good wheats of the macaroni type."

Times of Sunrise and Sunset at Brisbane, 1908.

DATE.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON. H. M.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.3	5.34	5.29	5.47	4.58	6.5	4.46	6.23	4 Sept. ☾ First Quarter 6 51 a.m.
2	6.2	5.34	5.28	5.48	4.57	6.6	4.46	6.29	10 " ○ Full Moon 10 23 p.m.
3	6.1	5.35	5.27	5.48	4.57	6.7	4.46	6.29	17 " ☾ Last Quarter 8 33 "
4	5.59	5.35	5.25	5.49	4.56	6.8	4.46	6.30	26 " ● New Moon 0 59 a.m.
5	5.58	5.35	5.24	5.49	4.55	6.8	4.46	6.31	
6	5.57	5.36	5.23	5.50	4.55	6.9	4.46	6.32	
7	5.56	5.36	5.22	5.50	4.54	6.10	4.46	6.32	3 Oct. ☾ First Quarter 4 14 p.m.
8	5.55	5.37	5.21	5.51	4.53	6.10	4.46	6.33	10 " ○ Full Moon 7 3 a.m.
9	5.54	5.37	5.20	5.51	4.53	6.11	4.46	6.34	17 " ☾ Last Quarter 1 35 p.m.
10	5.53	5.38	5.19	5.52	4.52	6.12	4.47	6.35	25 " ● New Moon 4 47 "
11	5.52	5.38	5.18	5.52	4.52	6.13	4.47	6.35	
12	5.51	5.39	5.17	5.53	4.51	6.13	4.47	6.36	
13	5.49	5.39	5.16	5.54	4.51	6.14	4.47	6.36	2 Nov. ☾ First Quarter 0 16 a.m.
14	5.48	5.39	5.15	5.54	4.50	6.15	4.48	6.37	8 " ○ Full Moon 5 58 p.m.
15	5.47	5.40	5.13	5.55	4.50	6.16	4.48	6.38	16 " ☾ Last Quarter 9 41 a.m.
16	5.46	5.40	5.12	5.55	4.49	6.16	4.48	6.38	24 " ● New Moon 7 53 "
17	5.45	5.41	5.11	5.56	4.48	6.17	4.49	6.39	
18	5.43	5.41	5.10	5.56	4.48	6.18	4.49	6.40	1 Dec. ☾ First Quarter 7 44 a.m.
19	5.42	5.42	5.9	5.57	4.48	6.19	4.49	6.40	8 " ○ Full Moon 7 44 "
20	5.41	5.42	5.9	5.58	4.48	6.20	4.50	6.41	16 " ☾ Last Quarter 7 12 "
21	5.40	5.43	5.8	5.58	4.47	6.20	4.50	6.41	23 " ● New Moon 9 50 p.m.
22	5.39	5.43	5.7	5.59	4.47	6.21	4.51	6.42	30 " ☾ First Quarter 3 40 "
23	5.38	5.44	5.6	5.59	4.47	6.22	4.51	6.42	
24	5.37	5.44	5.5	6.0	4.47	6.23	4.52	6.43	
25	5.35	5.44	5.4	6.1	4.46	6.23	4.53	6.43	
26	5.34	5.45	5.3	6.1	4.46	6.24	4.53	6.44	
27	5.33	5.45	5.2	6.2	4.46	6.25	4.54	6.44	
28	5.32	5.46	5.1	6.3	4.46	6.26	4.54	6.44	
29	5.31	5.46	5.1	6.3	4.46	6.26	4.55	6.45	
30	5.30	5.47	5.0	6.4	4.46	6.27	4.55	6.45	
31	...	...	4.59	6.5	...	...	4.56	6.46	

Horticulture

FLOWER GARDENING, No. 9.

By THE EDITOR.

PLANTS SUITABLE FOR OUT AND IN DOOR CULTURE.

CALCEOLARIA.

These highly ornamental plants are general favourites for the decoration of the bush or green house. The seed should be sown in the autumn. They require rich, light, fibrous soil and plenty of pot room. They are tender plants, and must be carefully raised in a seed box or pot.

HYBRID CALCEOLARIAS.

The cultivation of hybrid calceolarias is not difficult, but it is absolutely necessary for the production of good plants to keep them growing without the least check from the time the seedlings are pricked off until they have outlived their usefulness. The seed should be sown in shallow pans filled with soil composed of leaf mould, sand, and fibrous turf; the top portion of the soil should be run through a very fine sieve. Before filling, the pans should be provided with ample drainage. As the seed is very fine, no soil is necessary to cover it, but it will be well to water the surface of the soil in the pans before sowing the seed, which may be scattered evenly on the damp surface after the water has drained away sufficiently. Cover the seed pan with glass, and it should be kept covered and the covering removed only when the soil needs watering, which should be done by dipping in a pail or tank of water, so that there will be no danger of disturbing the seed in course of germination. When the little plants are easily discernible, the glass may be removed from the pans, and when the seedlings can be easily handled they should be pricked off into flats, about $1\frac{1}{2}$ inch between the plants. They may remain in the flats until they show signs of crowding, when they will require to be potted into the smallest sized pots, using less sand and leaf mould and more fibrous loam, with the addition of a reasonable portion of well-rotted cow manure, and continuing to increase the sustaining nature of the potting material with each successive shift. Calceolarias will not at any stage of their growth take kindly to the full sunlight; but a thick shading is not what they want. Rather place them, if possible, in a situation where they can have adequate light, such as a northern exposure of a house or frame affords—in fact, a cold frame is just the place for them during a great part of their growing period. A cool temperature is essential to their proper development, just as careful watering is necessary to bring them to perfection. They can be flowered in 6-inch pots, but 7-inch pots will give better results. Liquid manure, when they are beginning to show flower, helps them considerably. When the plants are fully grown, they should be placed so that the leaves of one do not touch those of another. Greenfly, if allowed to attack them, will soon ruin them; the safest preventive is the distribution of tobacco stems liberally around the pots.

CINERARIA.

Cinerarias are generally raised from seed sown from September to December for autumn flowering, and in April and May for spring flowering. In common with the calceolaria and the Chinese primrose, they are best treated as annuals. The seed should be sown in shallow pans containing a compost of sifted leaf-mould, loam, and sand, and kept shaded. When the seedlings are

large enough, prick them out into 3-inch pots, and again into blooming pots as soon as the smaller pots are well filled with roots. Use light soil mixed well with old cow manure, a little sand, and old vegetable mould made from decayed leaves. Transfer them to the bush-house as soon as established in the blooming pots. Strict attention must be paid to watering, and weak applications of liquid manure are beneficial during the flowering period.

An authority on flower gardening writes on the subject of these plants to the "Australian Gardener," and, although it repeats some of my remarks, I quote him as bearing them out:—"Cinerarias, when well grown, are well worth the trouble necessary for their successful cultivation, but, like many other things, if they are in any way neglected, they are almost useless, and seldom pay for the labour expended on them. The most essential point in the culture of cinerarias is to keep them growing uninterruptedly from start to finish, never to let them get potbound until they are in their last or flowering pots. Equally important, perhaps, is the keeping of them in as cool a temperature as possible when growing on, and in order to do this the plants when in pots should be grown in a cold frame on a bed of ashes, with the sashes sloping to the north. The seed should be sown in shallow pans over a filling of sand, loam, and leaf mould in equal parts, pressed firmly. The seed should be scattered thinly over the surface, and covered lightly with sand, and then watered carefully with a fine rose. Place the pans in a cool place immediately, and attend carefully to watering until the seedlings are above ground and fit to handle, when they may be potted at once into the smallest sized pots obtainable, using soil for the first potting of the same materials and proportions as for the seed. But, in subsequent potting, soil composed of two-thirds good fibrous loam and one-third of sand, with a good sprinkling of sand added, will suit them better. For the last potting it will be very beneficial if only a little leaf mould is put into the compost, and in its place is afforded well-rotted cow manure without sand. When there is danger of allowing the plants to remain longer in frames, they should be brought into the greenhouse, still kept cool but somewhat moist with an occasional aid to the circulation of air by a little fire heat, especially in very damp weather. The temperature at night should not exceed 48 degrees, allowing a rise of about 10 degrees with sunlight. When the flower buds appear, applications of liquid manure will help the plants; but it should be rather weak, or else use the precaution of watering immediately after with clear water. Cinerarias are subject to green fly, but the plants will stand fumigating mildly. Tobacco stems scattered among the pots will act as a preventive also."

SOME GOOD CALCEOLARIAS.

Dalkeith Park Strain.—Flowers beautifully spotted and tigred, of the most brilliant colours.

Hybrida grandiflora; *Hybrida striata*, and many tigred and self-coloured.

CYCLAMEN.

This is another beautiful member of the tribe of tuberous greenhouse plants produced from seed. They may be sown from December to March, are perennials, and present a most charming appearance during winter and spring. They remain a very long time in bloom. The seed should be sown in a soil composed of loam, peat, and a small quantity of fine cowdung and sand. Sow thinly, and cover lightly. Water with a fine rose, and do not let the soil become dry. When the small bulbs are formed, pot off into small pots, taking all the fibrous roots with the plants. In potting, bury the bulb, just below the surface of the soil, up to the crown. They require shade. When the leaves show signs of dying, give less water for a time, but do not let them get quite dry. As soon as they begin to show new growth, re-pot into fresh soil.

SOME GOOD CYCLAMENS.

Cyclamen giganteum (Margaret).—White, with lilac eye. *C. Persicum giganteum* (Snowflake).—Very large, dazzling, satiny white; petals large, habit compact, growth vigorous. *C. Persicum* (Papilio).—This is a very charming variety, perfectly distinct from all others. *C. Bush Hill* (Pioneer).—A beautiful feathered and crested variety. *C. Persicum giganteum sanguineum*.—One of the finest varieties. The flowers are of a deep, rich shade of blood-red. *C. Rococo*.—This variety has finely-marked leaves and an abundance of flowers on long, upright stalks. The large, flat, round flowers, sometimes 4 inches across, contain five or six petals, which are finely imbricated and undulated. The colours are very pretty, and include pure white, white with purple eye, dark-red, rose, &c.

CALADIUMS.

Caladiums are, as all horticulturists know, grown only for their beautiful foliage. They are tuberous plants, which prefer a high temperature while in growth, and require much water. The latter, in cool climates, should be given warm; but in Queensland the water in summer is quite warm enough without any artificial aid to increase its temperature.

Although a greenhouse plant, the caladium will thrive in the warm coast districts in sheltered situations in the open, and generally in the bush-house. Preferably, they should be grown in pots. The pots containing the tubers should be taken in succession, in the spring, and placed in heat. Then, when the tubers have started to grow, they must be taken out, and re-potted in fresh soil, which must be light and rich, composed of loam, peat, leaf mould, rotten manure, and sand. They must be shaded, but kept in a warm atmosphere to ensure a sturdy growth. In summer, when the leaves are fully developed, they may be placed in the bush or green house. As the leaves begin to die off, the water supply must be stinted, and the tubers be kept nearly dry, but in a moderate temperature during the winter. Plant from September to November.

SOME GOOD CALADIUMS.

Anna de Condeixa. Argyrites; pale-green, with white spots. Belleyme; white variegated leaves. Beethoven; white ground, veined green. Chantini; reddish ground, spotted white. Dr. Lindley; crimson centre, the green ground marked with rose blotches. Felicien David; carmine, surrounded with white and veined red on green ground. La Perle du Bresil; white, delicately tinted with rose; midrib and veins dark green. Leplay; leaves marked white, and beautifully veined rosy violet. Louise Duplessis; red veins, white ground. Madame Heine; silvery white, stained and edged with pale green. Madame Marjolin Scheffer; white foliage, charmingly veined and netted rosy lake. Murillo; pale-green ground, crimson centre, midribs white, green edge. Pictum; green, blotched and spotted white. Pœcile; red and white spots. Prince Albert Edward; dark emerald green, rich crimson midrib, white spots. Reine Victoria; green veins and margins, spotted white and rich crimson. Ville de Hamburg; rose-coloured leaves, red veins. Wighti; green, spotted red and white.

COLEUS.

As a foliage plant, the coleus is very ornamental, the exquisite and varied markings and variegations of the leaves making them highly interesting. They may be grown from seed or propagated by cuttings, and grow very rapidly. In our Queensland climate, cuttings strike freely in the open, and the cuttings may be put in where the plants are intended to remain. In districts where no frosts occur, the plants will, with care, continue to grow all the year round. They must be grown freely, in good soil, with plenty of moisture, light, and air. It may be treated as a pot plant, and grown in a conservatory or bush-house. In this State it makes a magnificent garden plant, where it frequently

attains a height of 4 feet. The best plan is to put cuttings in in autumn, keep them in a moderate temperature during the winter, and pot them or plant them out in the early spring. The Mammoth Rainbow is a specially fine variety.

CROCUS.

The crocus is one of the earliest of spring flowers. It demands a light soil, and the bulbs should be planted tolerably deep in the ground. The colours of the flowers are white, blue, yellow-striped, and purple. They make very nice edging plants, and, in this State, may be planted at almost any time of the year. They increase so rapidly that they require to be taken up every year and divided.

ANNUALS—(*continued*).

Before continuing the directions for the cultivation of annuals, I wish to point out that there are many half-hardy and tender annuals which, in the Southern States, require the aid of artificial heat, when sown during autumn or early spring, until they are strong enough to be planted out in the open. Many of these require no such aid in this State. For instance, Aster, Balsam, Lobelia, Zinnia, Portulacca, &c., may be safely sown, in suitable soil, in sheltered situations in the garden, in the spring, in the same way as the hardier annuals, such as Candytuft, Calliopsis, Dianthus, Chrysanthemum, Marigold, Mignonette, Larkspur, Phlox, Stock, Gaillardia, Nasturtium, &c. Although, however, the climate of Queensland is admirably adapted to the growth of flowers, amateurs are often at a loss as to the method of dealing with plants, so as to ensure the best possible results, and it is with a view to assisting them in this matter that the following remarks are made. It will be quite understood that it is impossible to give anything like exact directions for the cultivation of every kind of garden flower, but I have endeavoured to cull from many horticultural works, and more particularly from the publications of Australian professional and amateur gardeners and nurserymen of known repute, such simple, practical rules as are generally applicable, and such as will put growers in a fair way of success.

SOIL.—In the first place the nature of the soil claims attention. For the larger class of seeds, such as Nasturtium, Sweet Peas, &c., ordinary garden mould is suitable; but to sow the finer seeds it is necessary to have the soil of fine consistency, freely mixed with sand, and, if possible, leaf mould or well-rotted turf. The surface should be raked very smooth, and, if dry, watered gently about an hour before sowing the seed.

SOWING.—When considerable breadth is require, it is desirable to sow all hardy seeds where they are intended to flower; but, in the case of tender sorts, and when only a small number of plants are wanted, it is always best to sow in specially prepared beds or boxes, and then transplant. When the seeds are sown, it is advisable to press the soil lightly down, so as to hold them in position, while the radicle, or first root, is pushed down into the ground. We would impress on amateurs the benefit of sowing thinly; thick sowing causes the young seedlings to become "drawn," and has the effect of making "leggy" and unhealthy plants.

For the cultivation of the finer strains of seeds, such as Primulas, Calceolarias, Cinerarias, &c., some slight extra care is necessary; the trouble will be amply repaid, however, by the quality of the produce. They should be sown in seed pans or pretty large pots, great attention being paid to the drainage. The soil must be made very fine on the top, and the seed thinly scattered. Do not cover the seeds with earth; but lay a piece of obscured glass, or, better still, a sheet of brown paper, over the pot; place in a cool greenhouse, near the glass, and when the plants appear attend very carefully to watering; pot out the young plants into "thumb" pots when strong enough to handle, and give a

moderately cool, even temperature, protecting them thoroughly from cold winds and sudden changes.

DEPTH TO Sow.—As to the proper depth to sow seeds, there can be no hard-and-fast line drawn, but it may be laid down as a rule that no flower seeds should be put more than $\frac{1}{2}$ -inch below the surface; indeed, most varieties will be sufficiently covered at a depth of $\frac{1}{4}$ -inch, only the very large sorts requiring more.

Fine seed, such as Lobelia, Mimulus, &c., require no covering beyond what is given by pressing the soil down after sowing.

TIME TO Sow.—Hardy annuals are those which may be sown in the open borders during autumn or spring, requiring no protection.

Half-hardy and tender annuals are those which, if sown during autumn or early spring, require the aid of artificial heat, frame, or bell glass; and also require protection until they are sufficiently strong to bear transplanting into the open border. They may also be sown in the open ground late in spring, when the weather is sufficiently warm to be suitable to their constitution.

Half-hardy Biennials and Perennials.—These are best sown during the months of September to December.

Hardy Biennials and Perennials may be sown either autumn or spring.

TRANSPLANTING may be done in most cases when the young plants have made the second pair of leaves, but with half-hardy and tender varieties it is advisable to prick them out at this stage into "thumb" pots—three to five plants in a pot—and keep them well sheltered and gently watered until thoroughly established before finally transplanting them.

WATERING.—Careful and judicious watering is a great point in the cultivation of flowers. Of course no rule can be laid down, but it is necessary to keep the surface always moist, especially before the seeds have vegetated. The neglect of half an hour may ensure a complete failure in the case of nearly all the small seeds. Always use a fine rose watering can, so as to prevent beating down or washing away the young plants. When the plants are flowering, they will require frequent watering if the weather be dry. An occasional watering with weak liquid manure will tend to prolong their flowering, and increase the size and brilliancy of the flowers; where the soil is poor, liquid manure watering is indispensable.

DRYING APPLES.

The apples are first peeled and cored by machines. Then they are cut into slices or rings. In order to prevent discoloration during evaporation, the slices are placed in a bleaching chamber, and there subjected to the fumes of sulphur. From this chamber the bleached slices are laid on wire trays in the drying chamber of the evaporator. In from three to five hours, the whole of the moisture is evaporated, and the dried fruit is packed in boxes holding from 25 lb. to 50 lb.

SISAL HEMP CULTIVATION PROJECT IN BRITISH GUIANA.

The news will be received with satisfaction in Georgetown that on the 21st ultimo a wire was received from New York, stating that all the necessary capital had been subscribed for putting into execution the project to extensively cultivate sisal hemp in the tract of country, comprising some 7,000 acres, in the vicinity of Bartica, granted by the Government for this purpose. Mr. Viton stated to a representative that something like 50,000 dollars will be put into circulation in the colony in putting the land into cultivation.—"Demerara Chronicle," 1st May.

Sericulture.

SILKWORMS AND HOW TO REAR THEM, No. 2.

FOOD.

The intending sericulturist, having decided on going in for the business, must at once set about planting his mulberry trees. The varieties recommended are—*Morus indica* and *Morus multicaulis*. The former, being cultivated as a shrub, gives several crops of leaves in the season, and has to be kept pruned to a height of 4 feet 6 inches. It is easily grown from cuttings, which will strike at any season of the year, and will grow anywhere except in a swamp. *Morus multicaulis*, known as the Manila variety, comes into bearing very early, and hence is useful for the early hatched worms. The variety of mulberry, however, need not be considered, one being just as suitable for the purpose as another.

The mulberry cuttings should be 6 inches in length, and planted in a bed 4 or 5 inches apart, leaving about 1 inch out of the ground. When they have struck, they should be transplanted to the land prepared for them, and planted 4 feet apart each way. This method of planting facilitates gathering the leaves, pruning, and cleaning. By the end of the season, the bushes should be pruned, cutting well into the head. The object being to prune for leaf, all useless twigs should be cut out, and a broad, flat top preserved; allow lateral shoots to grow. The object in pruning should be to induce an outward growth, so as to get a larger picking surface.

The gathering of the leaves is best done by cutting the plants right down to the ground—cutting, of course, only the quantity actually required—daily. The plant soon sprouts again, when the cutting is repeated, and so on. This system need not prevent those who have large standard trees from using them, but the shrub system is to be preferred where very large quantities of food have to be provided.

While on the subject of food, it may be mentioned that the Osage Orange (*Maclura aurantiaca*) is extensively used in America for feeding the silkworm, and is said to give better results than the mulberry, the silk produced being of much better quality and, in some instances, a less number of cocoons were required to produce a pound of silk from worms fed on this than from those fed on the mulberry. Lettuce leaves can also be used if the mulberry is a bit backward, but, of course, this is only a temporary expedient.

An accidental discovery was made by a lady sericulturist in America. Having an early batch of worms and no feed being available, she tried the leaves of the Ramie Plant (*Bœhmeria nivea*). The worms ate the leaves greedily, the result being larger cocoons and finer silk. This accidental discovery may be the means of providing food for silkworms at seasons when mulberry leaves are not available, and, indeed, may be the means of an extra brood or two being raised during the year and of superior quality. The ramie plant being of the same natural order as the mulberry—namely, *Utricaceae*—its being a suitable food is not to be wondered at. The ramie plant thrives luxuriantly in Queensland.

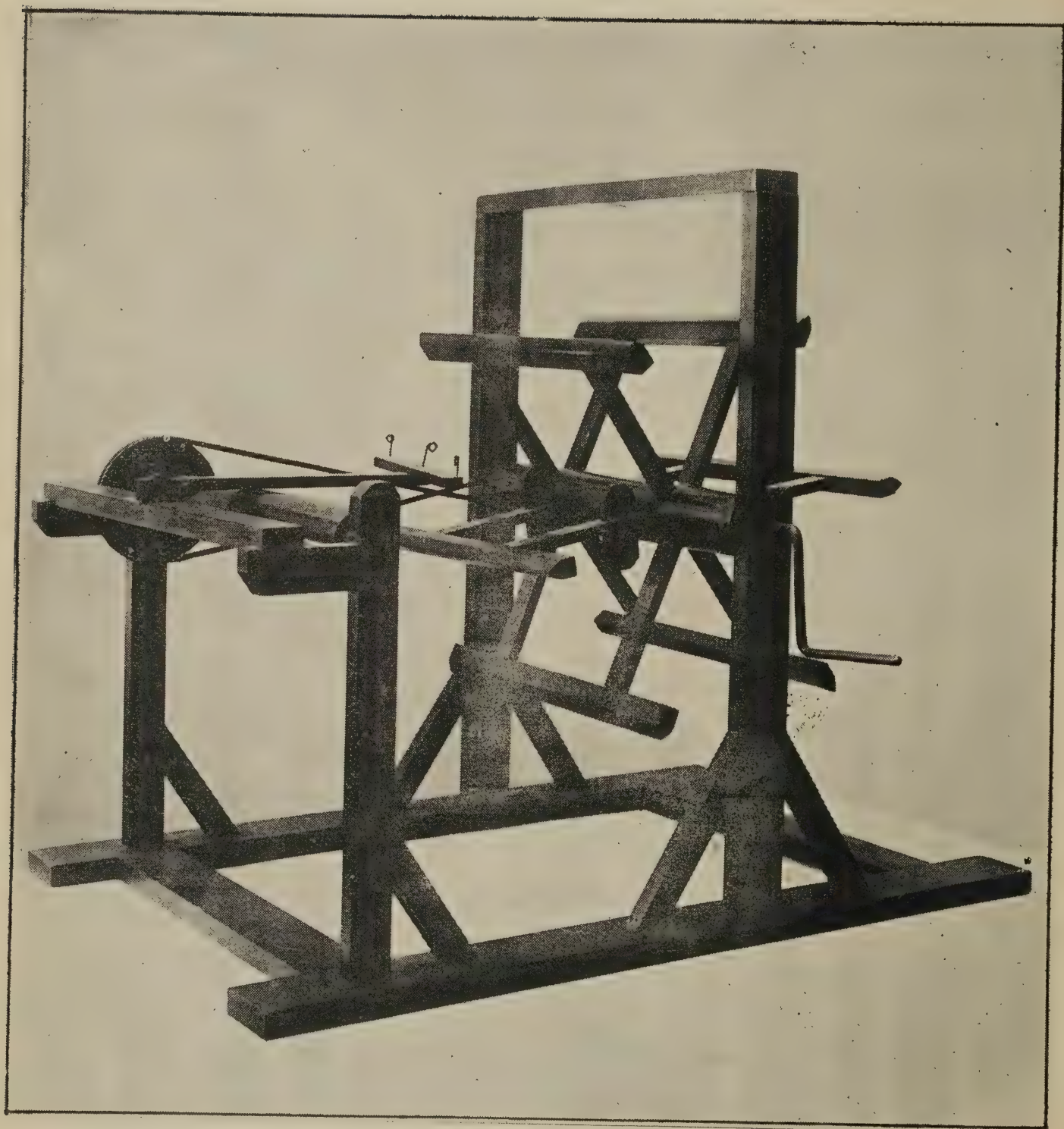
SILK REELING.

From the cocoon, the silk is, by different processes, transformed into spun or reeled silk.

Spun silk is made from pierced cocoons (that is, cocoons from which the moth has escaped) and silk waste, and serves in the manufacture of inferior classes of tissues.

The method of manufacture consists in cleaning and macerating the raw material, after which it is corded and made into thread, somewhat after the manner of cotton.

Plate XXVIII.



SILK-REELING APPARATUS,

The process of producing reeled silk, which will be hereafter described, consists, in general, in softening the gluten of the cocoons in hot water, and then taking the ends of the constituent threads of several of them together, and winding these threads from the cocoons upon a reel.

Thrown silk, the next process, is made from either spun or reeled silk. It is classified as "organzine" and "tram." Tram consists of two or three threads of reeled or spun silk twisted together at about 95 to 100 turns per running yard. It is used in making the warp in weaving. Organzine, used in the woof, is produced by twisting two threads together at about 500 to 600 turns per running yard, and then taking two of the threads thus made and twisting them together in the opposite direction at about 400 to 500 turns.

Of the three class of silk above mentioned, we treat here only of reeled, or what is commercially known as "raw" silk.

Hundreds of boys and girls probably have kept and are keeping silkworms as a pleasant amusement, but for want of knowledge the cocoons are always wasted. Our object is to show how these cocoons can be utilised and reeled into a commercial article.

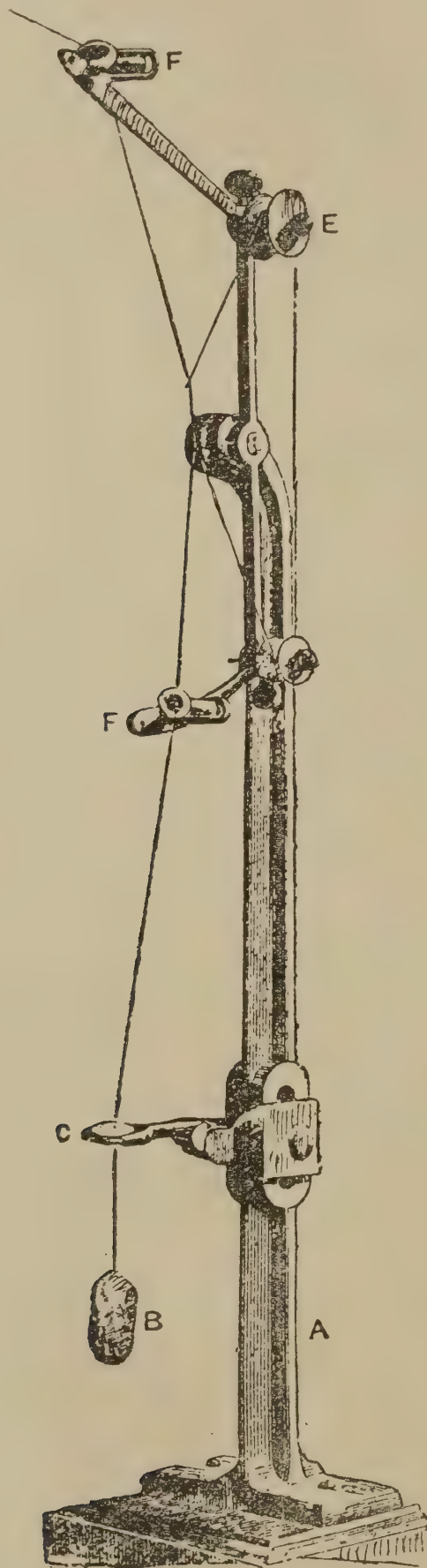
Cocoon-rearers must, however, bear in mind the two following essentials to reeling good silk:—First, the absolute necessity for raising good cocoons. The habit of placing the worms in paper cones to spin their cocoons must be discontinued. The result of this practice is, that the cocoons are badly shaped, irregular in size, and contain too great a quantity of loose or "floss" silk, which is a direct loss when reeling. A good cocoon is depicted in the September issue of this Journal. It should be nearly oval in shape, the outer lining of loose silk not too great, and the inner cocoon tough and strong enough to require some pressure to flatten between the finger and thumb, thus showing that it is compact and composed of a firm, continuous thread of good quality. A good cocoon contains about 1,150 feet of a continuous thread. Secondly, never crowd the silkworms together or stint their feed. A well-fed worm will naturally be healthy and strong, and make a good cocoon. The way to raise good cocoons was fully described in the September issue of the Journal.

REELING APPLIANCES.

Those who wish to make the appliances here described for themselves must first place their cocoons in the hottest sun for three or four days in order to "choke" the chrysalis. Further, it is an utter waste of time and cocoons to attempt to reel off a few dozen; remember that it takes from $3\frac{1}{2}$ lb. to 4 lb. of good cocoons to make 1 lb. of raw silk, and, as about 600 cocoons go to the pound, it will require about 2,400 of them to make 1 lb. of silk. Rather than reel off a small number, choke the chrysalides and keep the cocoons in a dry place till you have a further supply next season. The apparatus here depicted scarcely needs description. The "spreader" on the small front shaft is intended to spread the silk evenly on the reel. By means of a spiral groove on the shaft, it moves transversely to right and left, working a skein 6 inches wide. The groove is 3 inches long, $\frac{1}{2}$ -inch wide, and $\frac{1}{2}$ -inch deep. The centre of the groove should be exactly in line with the centre of the reel. The pin of the spreader is put into the groove, and the butt end screwed down to the rail so as to allow free play. A belt connecting the two shafts completes the reel. The construction of the spreader is shown in Plate XXVIII. The "croisure" used consists of three discs for twisting the filaments into two threads. These discs are of two sizes; two are 5 inches in diameter, 1 inch broad, and $\frac{1}{8}$ -inch thick, and one is 4 inches by $1\frac{1}{2}$ inch by $\frac{1}{8}$ -inch. The smaller disc is placed between the two larger ones; four segments of a circle a little thicker than the small disc are carefully glued round, and the two outside discs fastened together by screws or rivets through these segments, so as to allow of the inner one revolving freely. The inner disc will protrude three-quarters of an inch inside. Bend two pieces of brass wire about $\frac{3}{4}$ -inch in length into eyelets, and fasten them one on each side of the inner rim; then make two

little wooden knobs, like violin pegs, only much smaller, and fasten these on the flat of the inner disc opposite the eyelets. These serve as handles to twist the disc round. Now mount the three discs on an upright 9 inches by $1\frac{1}{2}$ inch by 1 inch, and fix the upright on the plate. The figure here shown is a modification of the "tavelette," or Italian system of forming the "croisure," the principle being to use one thread in reeling and twist it on itself.

This completes the apparatus, as shown on Plate XXVIII. (without the tavalette).*



In addition to the above, an ordinary tin washing basin and a brush are required. The basin may be fitted into a hole cut for the purpose in the table, and a spirit lamp placed under it on a shelf. The brush is just a bundle of twigs or fibres from a millet broom, about 6 inches long and 1 inch in thickness.

* This apparatus may be seen in the museum of the Department of Agriculture and Stock.

THE REELING PROCESS.

The cocoons must first be sorted into grades, those of the same size and colour being put together. Reeling can only be successfully done by experience; no amount of written explanation will make a skilful reeler. The water must not be kept at boiling point after the first lot of cocoons are put into the basin. Boiling point is necessary to cook the cocoons, so as to soften their "gluten," and thus allow of their being unwound easily. Whilst reeling, the temperature of the water should be about 180 degrees Fahr. If the cocoons do not unwind easily, the water must be brought up to this temperature.

Place a double handful of cocoons in the water; then, with the brush, dab the cocoons under the water for two or three minutes (this is the cooking process); then brush them over until the fibres of all are attached (called brushing). Take these in the left hand, and with the right hand keep drawing up and putting into the left all the floss silk till all the cocoons are attached by one clean thread. This is called "purging."

Now take the threads of five cocoons, and twist them between the finger and thumb, and pass this through one of the holes in the "filière" (C); then through an eyelet in the twisting appliance, then through the eyelet of the spreader, and thence on to the reel. Now take another five cocoons, and do the same. There will now be two threads on the reel, and, in order to consolidate the filaments of the five cocoons comprising each thread, a twist will have to be given, and this is done by turning the inner disc round from left to right; from six to eight turns will be sufficient. This twisting or crossing the threads has only to be done at the start and after each break in the thread, not kept up continuously so long as the threads continue winding on the reel.

Now start the reel. It takes two people to do the reeling—one to turn the wheel, and one to attend to the cocoons. The reel should be turned in the direction away from the cocoon basin. The five cocoons forming each thread will commence to unwind readily. As the reeling proceeds, the filament comprising each cocoon becomes so very fine that it would not bear the strain of reeling; therefore, the threads made up of the five cocoons, by the time they are half unwound, will require an additional cocoon. Then, again, one may break or be unwound more quickly than the other, and it is here where the skill in reeling comes in. The attendant at the basin must endeavour to have a regular and even thread of the same thickness throughout. The thread must also be continuous throughout the skein, so that, when a break occurs, the two ends have to be brought together and neatly tied.

In attempting silk reeling, the amateur must not be discouraged if things do not come right at first; a little determination will overcome all obstacles.

Other varieties of silkworms will be described in our next issue.

BOUNTY ON COTTON.

The Federal Bounties Act of 1907, now in force, provides for the payment of a bounty, for eight years, of 10 per cent. on the market value of cotton grown and ginned within the Commonwealth by white labour. The same bounty is also payable on the market value of cotton seed. The Minister for Customs has had under consideration certain difficulties with regard to the payment of the bounties on these products. During his visit in August last to Queensland, he found that, as a rule, 1 ton of cotton yielded 640 lb. of ginned cotton—that is, lint—and 1,600 lb. of seed. It has, therefore, been determined that the bounties are to be paid on this basis.

Tropical Industries.

CIGAR LEAF.

By R. S. NEVILL.

Now that the growing of cigar leaf has become established in some of the districts in North Queensland, a few suggestions for the guidance of intending growers will probably be of value.

If we are to find an outlet for this tobacco when the limit of local consumption is reached, it is necessary that we should produce a fine quality with a large percentage of wrappers and binders. To do this we must strive for quality and not for quantity, and the greatest care must be taken in growing, cultivating, handling, and curing the crop, and under the proper conditions of heat and moisture, these latter being absolute necessities for the production of high-grade tobacco. To grow a high-grade wrapper, tropical conditions are necessary—either natural, as are found in tropical districts, or artificial by covering the fields with tents or slats, as is done in temperate and subtropical countries.

Wrapper leaf requires to be thin, strong, soft, and satiny in finish, with very fine, almost invisible, fibres. To accomplish this, hot humid conditions are necessary. If it is in the field in the cool months of June, July, and August, the dews and cold nights cause it to thicken, grow coarse, rough, and gummy, and to cure dark—all objectionable in the cigar wrapper. The time for beginning to sow seed beds is October; and for transplanting, December and up to the middle of January. Planting may be continued until the middle of February; but a sucker crop should not be taken from the crop planted after the middle of January. As soon as the final crop is taken off, the ground should be ploughed, and kept clear to prevent shoots from growing, and thus minimising the insect pest and preserving the fertility of the land. (See pamphlet "How to Cut Tobacco.")

The most convenient and economical way to hang it on the stick is to sharpen the stick at one end; and, when you want to put the tobacco on it, thrust it into the ground at an angle of about 45 degrees, and then place the plants astride it.



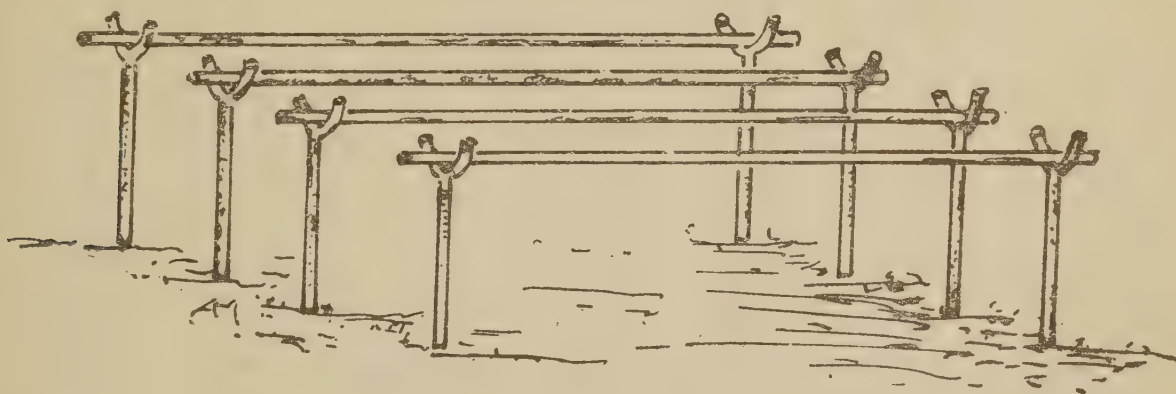
—Shewing how to place tobacco on Stick—

It can thus remain in position until it is desired to take it into the shed or scaffold.



— Cutting—Tobacco.—

For convenience while cutting, it is advisable to construct a scaffold to hang your tobacco on after sticking it; and you can thus go on with your cutting and sticking in the afternoon until night, and take it into the shed the following morning.



— Scaffold —

In putting the tobacco on the scaffold, it may be crowded up close, but must not be thick on the sticks.

It is important that farmers should be careful in assorting and classifying their crops, if they are to get the best prices, or if a good reputation for our tobacco is to be established. All rubbish should be thrown out, and nothing but serviceable leaf put in; dead, trashy, badly mutilated, badly sunburned, and dirty leaves should be discarded.

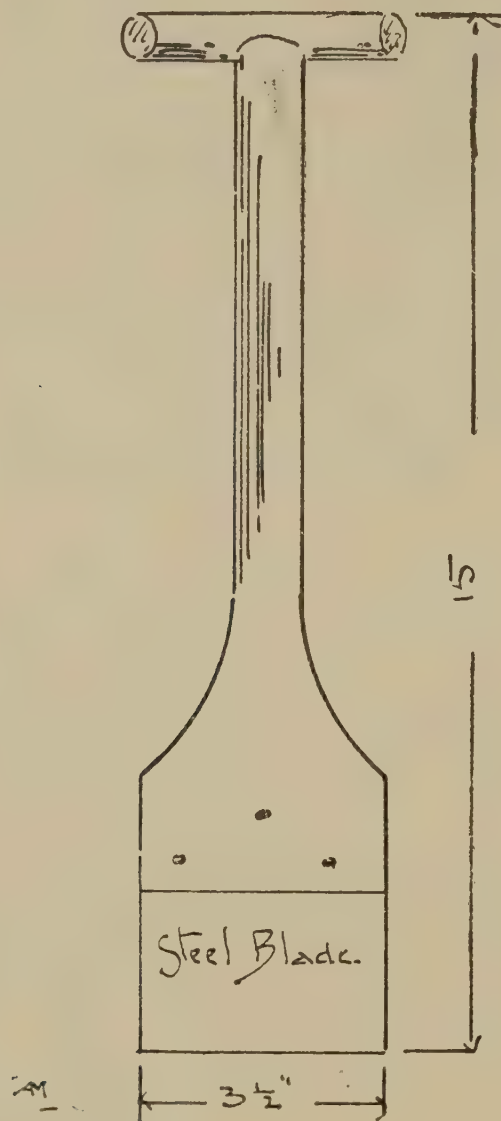
The handling should be neat; and in packing it should be placed in the cases straight, smooth, and even.

Neat and honest handling pays.

In curing, the shed should be carefully looked after, and care taken in filling it. The middle of the shed should be filled first, that it may get plenty of ventilation in the first stages of curing. In the early stages of curing, the ventilation should be well looked after, keeping doors and windows open during

the day when the weather is fine. If hard winds prevail, all openings on the windward side should be closed. When the tobacco begins to dry and take colour, then close sheds in daytime and open at night. This keeps a fairly uniform temperature, besides causing the tobacco to soften at night, and assists the colours to blend and become uniform.

Splotchy coloured leaves are undesirable. When the leaf has fully dried, keep shed closed, except in soft weather or at night when you want to get it in handling condition.



Knife for Cutting Tobacco —

I wish to impress upon growers that the advice given from time to time, for all stages of the crop, is not theory, but the experience of the best growers, and the new hand at the business who thinks he sees a better method and acts upon it is likely to pay for his method, either in the cost of production or the price of his crop. The plan of shed submitted is the latest approved by the experts of the Department of Agriculture in the United States, and it is advised that in building sheds the plan should be as nearly copied as possible.

A NEW IMPORTANT DWARF RUBBER

named "Ecanda," which yields good latex from the root, has been obtained, it is said, from the neighbourhood of Lake Nyassa, in Africa. In 1906, Mr. C. E. de Mello Geraldles, Professor in the Instituto de Agronomia e Veterinaria, at Lisbon, published an article dealing with a new rubber plant known in Benguela as "Ecanda," or "Marianga"; and in 1907 a short abstract from the paper appeared in the "Indian Rubber World" (Vol. XXXVI., p. 300).

About the same time (says the "Ceylon Tropical Agriculturist"), a portion of a tuber was submitted to Kew, for identification, by Mr. Spencer Brett. It was made out to belong most likely to the Asclepiadaceous genus, *Raphionacme*. Later on, Kew received from the Companhia de Moçambique a number of healthy specimens of "Bitinga" tubers, or tubers of the plant from which the Bitinga rubber is extracted. They were evidently identical with the tuber communicated by Mr. Brett, and stated to have come from West Africa. The tubers have been grown in the Royal Gardens; and one of them flowered early in March of the present year. Following is a general account of

THE PLANT AND ITS PROPERTIES.

The "Bitinga" plant agrees very well with the description and figures given by Professor Geraldès of the "Ecanda" plant, and there is practically no doubt that they are identical. It is a new species of *Raphionacme*, nearly allied to *R. Welwitschii*, Schlechter and Rendle, a native of Central Angola, and is described below as *Raphionacme utilis*, Brown and Stapf. It differs from all the rubber plants already known, in so far as it is a dwarf herbaceous plant with a fairly large subterrestrial tuber abounding in caoutchouc. As practically all our knowledge concerning the distribution, properties of the plant, and the process of working it is at present confined to what we may learn from Professor Geraldès' article, a translation of the more important paragraphs is given here:—

"The interest attaching to the 'Ecanda' or 'Marianga' rests not only on the fact that we have to deal here with a new species, and, moreover, one which is morphologically different from all the other known rubber plants, but also, and more especially, as I believe, on its capacity of producing first-class rubber and the facility of working it, in which respect it has no rival. The 'Ecanda' is a herbaceous, stemless plant, with a tuber-shaped root fairly

LARGE AND RICH IN LATEX.

"From experiments made in the interior of Benguela, in order to find out the best process for the preparation of Ecanda rubber, I came to the conclusion that the only rational and practical method is by crushing the roots and treating the latex thus obtained by one of the processes of 'lato-borrachificação externa' (coagulation of the latex after extraction). It is evident that the method of first extracting the latex very much simplifies the preparation of rubber, and clearly results in considerable economy. The 'Ecanda' or 'Marianga'* is found in the treeless, sandy, and alluvial tracts (anháras) of Bailundo and Bihé and the Xánes (sandy and treeless tracts) of the region between the Rivers Kwanza and Zambese (Ganguellas), the home of the Otarampa (*Carpodinus chylorrhiza*).† Those tracts occur locally, as a rule, near the headwaters and along the banks of the rivers, occupying, sometimes, vast areas, and it is in their drier parts that the 'Ecanda' thrives. The altitude of the region where the 'Ecanda' grows is from 4,000 feet (Ganguellas) to 5,500 feet (Bihé).

"As stated, the laticiferous tubes of the 'Ecanda' are found spread all over the pulp of the root; at the same time the latex, being very concentrated, coagulates rapidly in contact with air. It is, therefore,

NOT POSSIBLE TO EXTRACT IT ENTIRELY FROM THE ROOTS BY MEANS OF INCISIONS.

"The extraction of the rubber direct from the roots, necessitating, as it does, first prolonged boiling and then crushing, followed by repeated washing,

* 'Ecanda' is the name by which the species (which occurs in Bailundo and Bihé) is known to the Bailundos and Bihanos; and it is, I assume, identical with the species known to the Lutzases (Ganguellas) as 'Marianga.'

† I suppose that the 'Ecanda' also occurs in the Xana of Xifumage (an affluent of the Zambesi which I have crossed), a vast, treeless, sand, and humus plain to the north-east of the district of Benguela. But when I traversed it the natives had set fire to it, as they are used to do, and the whole vegetation was destroyed.

is not practical, since, apart from the tediousness of the process, it implies necessarily the use of chemical agents in order to secure the complete separation of the caoutchouc from the pulp by the disorganisation of its tissues. And even so, unless dissolvents are used for the purification, the rubber remains somewhat impure, as may be well imagined.

"But to my great satisfaction I made sure that it was possible to extract the latex of the 'Ecanda' (although mixed with the sap of the roots) with great ease by means of simply crushing the roots. To extract the latex, proceed as follows:—After having washed the roots well, cut them into several pieces at a right angle to their greatest diameter, and subject them to a slight pressure in a copying-press. When the liquid ceases to flow, raise the top of the press, turn the pulp, and subject it anew to slight pressure. Repeat these operations as long as the liquid comes out yellowish and without streaks of white—that is, to the point when the latex is completely extracted and only root sap continues to flow.

"To obtain this result, it is necessary to extract from the roots, on the average, 77·7 per cent. (of the weight) of the liquor; hence the latex is much diluted (1·5 per cent. of the liquid extracted from the roots should, on the average, be pure latex). Having found a practical process for extracting the latex, I tried now to determine the best method for coagulation. I obtained good coagulation with alcohol or brandy whenever the latex was not very much diluted. This process is evidently not economical, as the coagulating agents are dear. . . . Acetic acid, sulphate of aluminium and potassium, phenol and chlorate of sodium do not act on the latex diluted with root sap. . . . Other coagulating agents I was not able to try. . . . It is, however, probable that coagulation of the latex of 'Ecanda' may be obtained with other agents, even when it is diluted with root sap. The process of skimming leaves much to be desired, since, in my experiments, I have never succeeded in extracting by this method more than half of the caoutchouc contained in the latex. . . . I also studied the effect of heat on the liquid obtained by pressing the roots of the 'Ecanda.' 'If the liquid is subjected direct to the action of fire, a skin forms on the surface, like that on boiled milk, consisting of caoutchouc. If this skin is removed in the measure as it forms, its production ceases after some time, and when at length the liquid is completely evaporated a copious yellow and viscous residue is left. By

SUBSTITUTING A HOT BATH FOR DIRECT FIRE

and proceeding in the way just described, there also remains a yellow and viscous residue, but it is less copious. In this way I obtained a greater percentage of caoutchouc which was of greater elasticity than that produced by coagulating direct over fire. Thus, by using heat as the coagulating agent, I always obtained, beside the caoutchouc, a more or less copious residue of a yellow and viscous substance. Now, it is well known that generally caoutchouc, if subjected to temperatures above 35 degrees C., gradually loses its elasticity, and turns viscous, until at 170 degrees to 180 degrees C. it is converted into a thick liquid much resembling molasses. Therefore, it might be supposed that the residue mentioned above also consisted principally of resinified caoutchouc.

"My suspicion was confirmed when treating the latex by a mixed process of skimming and spontaneous desiccation.†

† To extract the rubber by this method I proceeded as follows:—I poured the liquid obtained by the crushing of the 'Ecanda' roots into enamelled iron dishes, so as to form a layer 1 cm. thick. After a while, in everyone of the dishes and adhering to their sides, a skin of rubber formed on surface of the liquid. This skin I removed, and so I went on for two days—the duration of the experiment—new skins continuing to form, but every time less thick. Then the production of skins ceased. But, to make sure whether the liquid still contained caoutchouc, I left it in the dishes until the evaporation was complete, which was the case five days after the commencement of the experiment. As the dishes were exposed to the air, and the latex somewhat caught the sun, I believe that the little yellow and viscous residue which formed consisted to a small extent of resinified rubber.

“By this method I obtained a much higher percentage of rubber and only a small residue, consisting likewise of a yellow and viscous matter. However, the rubber was less elastic than that obtained by coagulation in the hot bath. This is not surprising, seeing that the rubber prepared by the latter process contains all the components of the latex and the root sap (excepting the greater part of the water), and, besides, I had not been able to strain the liquid, having no metal net nor adequate strainer with me.

Processes employed.	Percentage of Raw Rubber per Cent.		Loss by Drying per Cent.
	Green.	Dry.	
Coagulation over fire	2·90	1·870	35·50
Coagulation in the hot bath... ..	3·54	2·415	33·09
Skimming and spontaneous desiccation	13·00	6·360	51·60

“In order to determine the

PERCENTAGE OF PURE CAOUTCHOUC OBTAINED

by these processes, I analysed the samples of ‘Ecanda’ rubber prepared in Benguela, in the chemical laboratory of the Instituto de Agronomia e Veterinaria, with the following results:—

RUBBER OBTAINED BY COAGULATION IN THE HOT BATH.

	Per Cent.
Caoutchouc	88·025
Resins	4·725
Substances soluble in water	1·100
Substances soluble in alcohol at boiling point	1·300
Water	1·082
Impurities not determined	3·768

RUBBER OBTAINED BY SKIMMING AND SPONTANEOUS DESICCATION.

	Per Cent.
Caoutchouc	71·925
Resins	3·300
Substances soluble in water	2·950
Substances soluble in alcohol at boiling point	1·385
Water	3·154
Impurities not determined	16·926

“Thus I obtained by coagulation in the hot bath 2·125 per cent. of chemically pure caoutchouc, calculated from the weight of the fresh root; and, by the mixed method of skimming and spontaneous desiccation, 4·574 per cent. of pure caoutchouc—that is, I obtained by the latter process more than twice the quantity of pure caoutchouc than by the first.

“It follows, therefore, that, of the processes which I tried, it was the process of skimming and spontaneous desiccation by which I obtained the best result. The great drawbacks inherent in that method are, however, aggravated when it is applied to the treatment of a liquid resulting from the crushing of the Ecanda root, and that makes it hardly practicable.”

SISAL HEMP IN SOUTHERN QUEENSLAND.

Mr. T. H. Wells, of Farnbro’, has been busily engaged in forming a sisal plantation in the Childers district, a portion of which has come to maturity, or, rather, to that stage when the first crop of leaves is ready to be taken off. Mr. Wells has successfully overcome all the preliminary difficulties in establishing his plantation, and, having installed some very up-to-date machinery (the Finnigan-Zabrieski scutching machine), has placed a quantity of excellent fibre on the market.

Whilst this work was proceeding in the Central district, Major A. J. Boyd has been equally hard at work establishing a plantation in the Tingalpa district, near Brisbane. Of the 69 acres under sisal, none is as yet over four years old, but the plants are thriving; and it is hoped to obtain machinery and produce a fair quantity of fibre next year. Here, also, the initial difficulties were great. The land was heavily timbered; and two years ago, owing to an abnormal growth of grass, when bush fires were raging in the district, the plantation was swept by fire, fences and buildings being destroyed before the fires could be subdued. Singular to say, scarcely any damage was done to the plants, as may be seen by the accompanying illustration of a portion of the plantation. Owing to the undulating nature of the land, only a small portion of the plantation can be shown. In the nurseries, there are some 20,000 plants awaiting transplanting as soon as present contracts for clearing and holing are completed. Some *sansivieria* has been planted, but the climate is not favourable to its rapid development. The same may be said of ramie, of which some plants were put in as an experiment.

Some 16 acres of sisal have been planted at Peel Island, where the plant thrives well. A portion of this has long been ready for cutting, and during last month a commencement was made, the leaves being sent to St. Helena for treatment.

SISAL HEMP AT ST. HELENA.

To those who are interested in the cultivation of sisal hemp, a visit to the Penal Establishment at St. Helena would not fail to afford a most valuable object lesson. It is true that the soil on the island is rich; but for a long series of years forage crops, lucerne, and sweet potatoes have been grown for the use of the dairy stock on the island, and of late it has been found advantageous to apply manure to the land. Whilst a considerable amount of manure is obtained through the medium of the dairy and horse stock, a far greater proportion is derived from a kind of peat which is present in large quantities on the seashore. This is dug out, and put in heaps to allow the salt to leach out of it, when it is applied with good effect to the soil. We have already, in previous articles, described the original plantation of sisal, which was, in point of fact, merely a narrow strip planted on the edge of the western slope to act as a breakwind to shelter the other crops. About four years ago a larger portion was systematically planted on what had been a lucerne field. Later on, the steep slope facing the sea was planted. The former plot was kept clear of weeds, but the steepness of the latter precluded any attempt at cultivation, and the sisal plants disputed the land with tall weeds and grass which at times overtopped them. All that was done to these plants was to occasionally chop down the weeds and undergrowth. On the cultivated plot, the couch grass took possession, and cattle were put on to graze it down. This they did without any damage to the sisal plants, and no other attempt was made to get rid of it. The growth made by both these plots is most surprising. The plants everywhere are of great size, with fine healthy leaves from 5 to 6 feet in length, from fifteen to twenty of these being ready for taking off each plant. It is unfortunate that the area available for this crop is so small. If 300 or 400 acres could have been planted, the returns would, at the prices for the fibre which have been paid for the St. Helena output during the past two or three years, have been very large.

During the past month, the small Lehmann decorticator, driven by a 6½-h.p. Campbell oil engine, has been engaged on preparing fibre from leaves produced on the plantation at Peel Island, which are cut, taken over to Dunwich, and thence by steam to St. Helena. It may here be remarked that it is distinctly laid down in the pamphlet on "The Sisal Industry in Queensland," issued by the Department of Agriculture and Stock, that no more leaves should be cut than can be worked off during the day, except that sufficient leaves should

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remain over to carry on next day until fresh supplies come in. So many leaves, however, were sent from Peel Island at one shipment that a fortnight's work will be needed to get through them. The result, as pointed out by Mr. Bowden, the chief warder at St. Helena, is that the work of cleaning the leaves is almost twice as great as that required for leaves freshly cut. We did not visit Peel Island to note how the cutting is being done; but, judging by the leaves sent to the machine, much that is immature has been cut, and this, taken in connection with damaged and short leaves, will necessitate either laborious sorting or the sale of the whole of the fibre as second grade.

As for the work at St. Helena, under Mr. Bowden's superintendence, it goes on most methodically. Mr. Bowden's experience and enthusiasm in the work have enabled him to train certain men to the work, and to prepare the fibre to the best advantage. Under these circumstances, it would be impossible for any country in the world to produce a more beautiful or stronger or longer fibre than that of St. Helena.

SUGAR-GROWING IN QUEENSLAND.

Some interesting facts concerning the rise and progress of the sugar industry in Queensland may be found in Lock and Newland Bros'. publication, "Sugar." It is there stated that "the crop of sugar in Queensland amounted, in 1879, to about 18,200 tons, or about 4,500 tons above that of the previous year. The approximate output of the four sugar districts was—

	Tons.
Southern district	2,200
Central	5,750
Mackay	9,500
Cardwell	750

"The output for 1880 was estimated at 21,000 tons.

"Throughout Moreton Bay, previous to its separation in 1859 from New South Wales and its formation into Queensland, the sugar-cane was cultivated in the gardens of several people, so that there was little doubt as to the possibility of its culture.

"The first sugar known to have been produced in Queensland was made by Mr. Buhôt, of Barbados, from cane grown in the Botanic Gardens, Brisbane, in May, 1862. In 1863, Captain Louis Hope had 20 acres under cane. By the end of 1867, there were 2,000 acres under cane, and the 6 mills in existence manufactured 168 tons of sugar.

At the close of 1869, there were 28 mills at work, crushing the cane from 1,230 acres out of over 5,000 acres under cultivation. In 1875, the season turned out very bad; the cane, nearly drowned in wet, became unhealthy and died, giving next to no returns. In the course of time, the evil effects of 1875 passed away; and the sugar industry has been since then more or less a success. The average yield of sugar per acre in Queensland, for the ten years ending 31st March, 1879 (and including the rust year, 1875), was as follows:—

	Cwt.	qrs.	lb.
Southern district	24	0	25
Central	24	2	9
Mackay	27	0	23
Cardwell	30	1	2
Queensland	25	3	0

"Edwards, in his 'History of the West Indies,' speaks of soil in Jamaica which, with plant cane, will produce $2\frac{1}{2}$ tons of sugar to the acre. In Queensland, $3\frac{1}{2}$ tons and over have occasionally been obtained from soils newly broken up. The manufacture of rum from 1867 to 1888 was 1,842,322 proof gallons. Up to 1876 the yield was at the rate of over 2 gallons of molasses fermented to 1 proof gallon of rum distilled. During 1880 no less than 5,500 tons of Queensland-grown sugar were exported, besides large quantities of rum, treacle,

and white spirits. A plantation on the Mackay [Pioneer] River was sold for £95,000 cash. It was estimated to produce in the 1881-2 season 1,200 tons of sugar."

This was probably the River Estate Plantation, adjoining the "Cedars."

It was in 1872, however, that the rust attacked the then universally grown Bourbon cane, and in that year heavy frosts in September added to the destruction. The first mills in Queensland were horse mills, most of which were afterwards converted into steam mills. Many of the horse mills had short vertical rollers, and every cane was separately put through them. The crushing power was very small, and quite 50 per cent. of the sugar remained in the megass after passing through the rollers. The juice, after clarification, was boiled in open pans, which were constantly skimmed, and on arrival at the last pan, called the "tache," it was there boiled until it resembled the boiling of porridge, when it was ladled out, or lifted by a dipper fitting the tache, and transferred to the coolers. Draining the sugar was only resorted to in one or two mills, most of them having centrifugals. In those early days sugar was worth from £38 to £40 per ton, and, had the planters owned such mills as we see to-day in Queensland, they would have made large fortunes. As time went on, however, the vertical rollers were superseded by the horizontal. Bauer pans and Wetzel pans were relegated to the scrap heap, and vacuum pans took their place. Most of the old pioneer planters lost heavily over their ventures; the old mills, which cost from £500 to £1,200, were abandoned; and the succeeding generation brought the Queensland sugar industry to its present state of perfection.

Statistics.

COMMONWEALTH METEOROLOGY.
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1907.					1908.							
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.
<i>North.</i>													
Bowen	1.28	0.51	0.06	3.71	6.39	10.14	5.63	9.46	3.73	0.99	0.45	0.88	0.51
Cairns	0.39	1.35	0.63	5.35	28.33	27.02	8.03	20.60	5.99	3.05	0.59	3.70	2.12
Geraldton	4.66	1.36	1.42	6.45	33.82	44.39	13.27	39.00	14.23	18.52	2.64	8.11	3.66
Herberton	0.11	0.12	0.17	3.41	9.57	9.29	5.02	8.92	1.40	0.38	0.31	2.36	Nil
Hughenden	Nil	Nil	1.66	0.66	7.75	0.98	5.18	6.91	0.30	Nil	0.05	0.68	Nil
Kamerunga State Nurs.	1.15	1.19	0.53	2.76	29.82	...	7.47	25.75	4.60	3.363	0.76	4.85	1.58
Mackay	0.25	0.12	0.12	5.76	9.70	9.28	3.83	17.43	14.82	3.25	1.29	1.65	0.71
Rockhampton	0.47	Nil	0.47	3.72	4.42	3.84	9.64	9.77	2.62	0.85	0.10	1.08	0.84
Townsville	0.07	0.14	0.03	2.82	24.26	12.21	6.69	9.03	0.38	2.22	Nil	1.70	...
<i>South.</i>													
Biggenden State Farm	0.96	0.24	1.99	2.50	5.55	2.37	9.82	9.84	2.97	0.74	0.43	0.49	2.33
Brisbane	0.79	0.10	1.37	4.25	3.21	2.80	8.43	18.19	2.45	2.40	0.17	0.77	2.83
Bundaberg	0.43	Nil	1.70	2.90	2.99	4.77	2.82	7.35	4.13	0.67	0.39	0.75	1.56
Dalby	0.71	0.15	0.69	5.18	1.44	0.17	4.88	7.61	0.11	0.37	0.63	0.14	1.80
Esk	0.81	0.57	0.50	3.76	3.72	2.61	10.06	17.04	2.83	1.07	0.23	0.46	2.75
Gatton Agric. College	0.56	0.15	0.71	3.01	4.55	...	3.38	10.74	...	0.10	0.16	0.6	2.71
Gindie State Farm ...	0.10	0.16	0.61	1.57	4.42	0.20	7.17	6.25	0.02	0.112	...	0.40	1.27
Gympie	0.17	0.47	1.20	3.05	5.49	6.26	11.77	80.8	1.87	2.00	0.38	1.16	2.87
Ipswich	0.43	0.05	0.78	4.45	3.40	1.32	6.63	13.77	2.71	1.14	0.12	0.47	3.23
Maryborough	0.93	0.25	2.74	3.49	5.81	5.62	8.07	11.40	2.52	1.05	0.46	0.81	1.98
Roma	0.42	0.04	1.04	3.70	2.51	0.04	6.38	2.51	0.22	Nil	0.55	0.63	1.38
Roma State Farm ...	...	...	...	...	...	...	...	...	...	...	...	1.27	0.73
Tewantin	0.95	0.55	1.05	3.12	7.36	10.42	12.47	14.39	7.59	8.66	0.75	1.97	2.70
Warwick	1.37	0.01	1.37	3.25	3.13	0.76	4.52	6.65	1.40	0.15	0.80	1.24	2.99
Westbrook State Farm	1.78	Nil	1.08	4.76	3.23	0.43	8.03	1.41	1.40	00.5	...	0.49	1.97
Yandina	0.68	0.80	1.44	2.87	3.05	8.37	14.47	16.62	5.45	4.59	0.58	2.64	2.18

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered approximate only.

GEORGE G. BOND,
Divisional Officer.

Animal Pathology.

NOTES ON THE PRESENCE OF TWO STOMACH WORMS IN CALVES HITHERTO UNRECORDED IN AUSTRALIA.

BY SYDNEY DODD, F.R.C.V.S.,
Principal Veterinary Surgeon and Bacteriologist.

In a recent article in the "Agricultural Journal" on stomach worms, reference was made to these parasites being a source of loss amongst calves. It was stated that the worm most prevalent in parasitic gastritis (stomach worms) in Queensland was the twisted stomach worm (*Strongylus contortus*). At the time of writing, although I suspected that this worm was not the only one present in affected animals, yet for various reasons I had not the opportunity to demonstrate the presence of any other species in this State until recently.

A short time ago such opportunity presented itself, when I had occasion to visit a farm on which a number of young calves were dying from a disease unknown to the owner, who was an experienced farmer.

On my visit several of the surviving calves were showing typical symptoms of stomach-worm infestation. The animals were weak and in very poor condition, although there was plenty of food for them and their appetites were good. The droppings had collected around their hindquarters and tail in some cases. Their eyes were very pale, and there were marked dropsical swellings under the jaw ("Bottle"), and also around the lower parts of the legs, but to a lesser extent. One of the calves showing marked symptoms was killed, and a *post-mortem* examination made immediately. The blood was very watery, and the tissues immediately under the skin in a very dropsical condition, the fluid draining away in a very marked manner. The kidneys were also dropsical, and there was more than a normal amount of fluid in the heart bag. The spleen was normal in size. On opening the fourth or true stomach, a quantity of sand was observed, but very little food. On turning out the stomach contents, there were seen to be enormous numbers of small worms wriggling about. Those visible were easily distinguished as the twisted stomach worm. Some of the stomach contents were removed for further examination. On the worms being separated from the stomach contents, it was found that the twisted stomach worm (*Strongylus contortus*) was not the only one present, but that there were large numbers of a much smaller worm—so small, indeed, that they may be easily overlooked in the turbid contents of the stomach, but they can be seen if they are placed in a shallow glass vessel with a little clean water. Microscopical examination of these small worms revealed the fact that they belonged to two species quite distinct from *Strongylus contortus*. These two worms are named, respectively, *Strongylus cervicornis* and *Strongylus gracilis*. The former was first described by Sir J. MacFadyean in 1896. He found it to be the cause of an alarming number of deaths in lambs in various parts of England; and he named it "cervicornis" owing to the bursa on the caudal extremity of the male having some resemblance to a stag's horn. This worm has been found to exist in New Zealand, but I believe this is the first occasion on which its presence or that of the other small stomach worm (*Strongylus gracilis*) has been recorded in Australia. *Strongylus gracilis* was also first described by MacFadyean, and has been found in cattle suffering from parasitic gastro-enteritis in England, also in the lining of the stomach of sheep, horses, and pigs.

Although it is recognised that an anatomical description of these worms is of very little assistance to a stock-owner, it is thought that an extract from the description will be of interest and of some use in enabling these two worms (*Strongylus cervicornis* and *Strongylus gracilis*) to be distinguished from the more prominent *Strongylus contortus*:—

STRONGYLUS CERVICORNIS.—"The males are smaller and less numerous than the females. The female is usually about two-fifths of an inch and the male about three-tenths of an inch long."

STRONGYLUS GRACILIS.—"Colour dull white. The female measures from one-seventh to one-ninth of an inch in length, and the longest males are a little over one-ninth of an inch long."

Strongylus contortus, on the other hand, is from one-half to one and a-half inch in length.

The life histories of *S. cervicornis* and *S. gracilis* are at present unknown; but it is probable that they have histories similar to that of the twisted stomach worm—that is, a certain period of their development is passed on pastures, and that their whole life is not spent in the alimentary canal of their hosts.

One of the reasons for publishing this note is that it is quite probable occasions arise where from visible symptoms everything points to parasitic gastritis (stomach worms), and yet to a casual observer, on making a *post-mortem* examination and on opening the fourth stomach, apparently worms are not in sufficient numbers to justify the diagnosis of stomach worms. In this case the method previously recommended should be adopted—that is, of putting a little of the stomach contents or, better, a scraping from the lining of the fourth stomach into a shallow flat-bottomed glass dish with a little clean water. The small worms can then be easily seen, if present. Treatment should be carried out on the same lines as recommended in Bulletin No. 1, taking care, if possible, to remove the affected animals from swampy ground to a dry paddock where there is abundance of dry feed.

Science.

WATER-FINDING.

Under the heading of "The Divining Rod," we have published several interesting articles on the subject of water-finding by means of a forked rod in the hands of someone gifted with the power of discovering subterranean water. Such a gift is one not to be despised in a country like Australia, some parts of which are devoid of surface water. We believe that there are some very successful water-finders in Queensland, but their modesty is so great that we seldom hear of their doings and of their methods from themselves. In New Zealand a clergyman has a wonderful gift in this direction—the more wonderful since he uses no rod whatever. He has been very successful in locating water in that country, and has given some account of his methods to a representative of "The New Zealand Farmer," from which journal we take the following account of the Rev. Mr. Mason's operations:—

Considering that the fact of water-finding is as well established as the demise of the late Queen Anne, it is astonishing how many people know absolutely nothing about it, and how many look upon it in the same light as telling fortunes by cards or tea-cup reading, and dismiss it all as "fudge." The divining rod has probably at times been used as a means of deception, but so have other things which, in the hands of the proper persons, are instruments for good; and the broad fact of being able to locate the position of underground streams of water, or the pools from which artesian wells are tapped, is as unassailable as the statement that the needle of the compass points north. The power is such a remarkable one that no wonder it was in by-gone days classed with the black art by the ignorant, and even in the light of present-day knowledge one cannot see it manifested without a feeling of astonishment and something approaching awe. The fact that the power is possessed by so comparatively few, and that thousands could walk over the same ground till they dropped from sheer exhaustion without experiencing any of the sensations which tell the water-finder that he is over living water, is in itself sufficiently remarkable, and is quite enough to prove to the "what I don't understand I don't believe" class of persons that the whole thing is fudge.

It is usual for water-finders to carry a forked stick, but Mr. Mason dispenses with this, and simply stretches his hands out. As soon as he comes over living water, he is affected with a trembling which seems to be in proportion to the size of the body of water over which he is standing. The pipe at his feet marks the spot at Richmond Hills where water was found in abundance at 50 feet after an unsuccessful attempt had been made at twice that depth only a few yards away.

Round about Auckland there are a good many settlers whose opinions on the subject are very different from those they held not so very long ago. At Otahuhu lives the Rev. Harry Mason, vicar of Holy Trinity Church, and he is one of the few in New Zealand who have the gift of locating water that is hidden from the ken of ordinary mortals. There are hundreds of well-authenticated instances in which he has found water for people who were badly in need of it, and, as the late Mr. Samuel Luke once said to the writer, "I don't know what the people out our way would have done this summer if it had not been for Mr. Mason." The numerous cases cited in support of his success, and also the somewhat unusual circumstances—that he was a clergyman, and did not make a profession of finding water—led a "New Zealand Farmer" representative out to the village one day recently to investigate first hand. After some

difficulty—for he has a cordial hatred of publicity—Mr. Mason was induced to talk about this gift, or power, or whatever we decide to call it, and, as he had had the advantage of a scientific education, his remarks on the matter are full of interest to the student of the question, and those who know nothing of it will see that water-finding is simply a manifestation of some force of which we have as yet only a very elementary knowledge.

DISCOVERING THE POWER.

"It is a rather peculiar story," said Mr. Mason, in answer to a question as to when he first became aware that he had the power. "About ten years ago, when I was in the Taranaki district, I met a Dr. —, who was travelling leisurely round the world, and he possessed the gift of finding water with the divining rod, or at least he said he did, though I did not give any credence to his claim, as I was a sceptic in those days. One day while on a farm in the neighbourhood, the owner of the place was complaining about the scarcity of water for his stock, and I said, laughingly, 'Oh, you should have Dr. — here. He would soon find you water.' They wanted to know what the doctor did, and I cut a rod from one of the trees near by, and, holding it like Dr. — used to, I walked a few yards to show the farmer how it was done. Suddenly, to my surprise, I found that I was affected just as the doctor had been, and the stick snapped under the influence that was exerted. This was the first indication I had of possessing the power, and, as I tell you, I had previously laughed at the idea of there being anything in it."

"But I understood that you did not use the rod?"

"Not now. And that is another peculiar story. One day, while working in the orchard, I discovered quite accidentally that I was affected without anything at all in my hands. I had just thrown down a grubber I had been using, and, after the manner of tired people, had yawned with my hands stretched out slightly behind me, when I felt a sudden trembling, and it seemed as if somebody had gripped me by the biceps and was trying to pull me backwards. Nonplussed for the moment, I pondered over the incident, and at last came to the conclusion that it must be the water. Subsequent events proved that it was so. With regard to the rod, my experience has been that it is not always reliable, as it will act in the hands of a hysterical or highly-nervous nature when there is really no water there. Nowadays I never use any rod or stick, but simply walk along with my arms stretched straight down by my side, pointing somewhat to the back. When over water, I feel the sensations that I have just mentioned, and it seems that the greater the body of water the more intense are the sensations set up."

SUGGESTED EXPLANATION.

"Have you formed any idea or theory about this much-discussed power?"

"Yes; and, though I have not previously seen it suggested, I feel convinced that it is the scientific solution of the great disadvantage, that none have been made by men of scientific attainments, but they have all laboured under this great disadvantage, that none of them have been possessed of this peculiar gift or power, or whatever you like to call it, of being sensitive to the influence of underground water. It is known that there is a certain amount of friction in flowing water. Professor Tait, of Edinburgh, has carried out experiments which prove this, and reliable figures can be quoted from his book, but, except to those acquainted with mathematical physics, those figures would convey little information. However, to give the results of his experiments in a popular form, I may say that I gather that the force generated by this friction decreases proportionately with a rise in temperature of the water. A certain volume of water of the temperature of 40 degrees Fahr. would generate a force about half as much again as a similar volume of water at 80 degrees Fahr., the velocities of the two currents being the same. Some people say that this force is magnetic, but

I think I have proved that it is not. I have insulated myself by standing on a piece of glass and also on rubber, and still have felt it. I have also experienced it while on horseback. Another experiment tried was with a magnetic needle, which I placed close to me in many different position while feeling the influence of the water, but the needle was not affected in the slightest. No; I think it is not magnetic. It is some force that is at present unknown. We are always discovering something new in the scientific world, some new forces—the Röntgen Rays, for example—and I am convinced that this power of finding water is explainable on a scientific basis, and upon that alone. You are aware that all currents, magnetic or electrical, must complete a circuit. As illustrations, the return circuits in connection with the tramways and the telephone may be mentioned. Now, my theory is that the friction of the running water, or, rather, living water, under the ground, sets up an energy which is not all used up in raising the temperature of the water, but comes up through the ground, and, finding me a good ‘conductor,’ flows through my body, and seeks to re-enter the earth by way of my arms, and so complete the circuit. I think that this is proved by the fact that when I stand over stagnant water—a well, for instance, in some cases—there is not the slightest effect on me.”

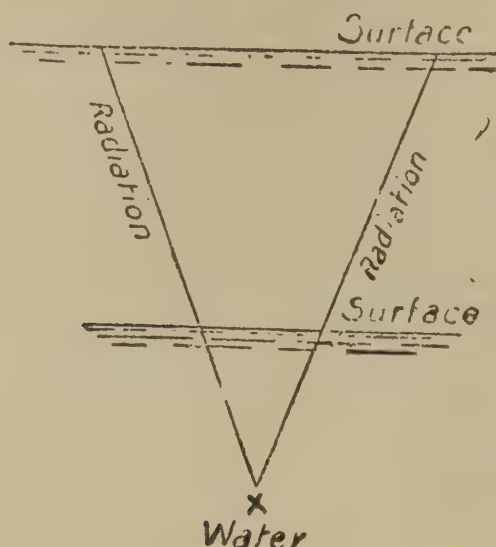
Mr. Mason was asked if he had any means of arriving at the probable depth the water would be found after he had located it.

“No,” was his reply, “I must confess that I cannot tell, except in country where I have located a lot of different spots, as at Papatoetoe, and there it is only by analogy, of course. However, I think it probable that there is some way of arriving at a solution, and am now working on the matter in conjunction with a mathematical friend of mine. It seems to me that there may be some relation between the width of surface of ground over which the force is felt and the depth from which the force comes. Let me explain. If it is not at a great depth from the surface, it will not radiate over much ground; but if it is situated at a considerable depth it will have time to radiate fan-like over a proportionately greater area of ground. This is only a supposition, but it seems to me there is something in it.”

Mr. Mason then gave demonstrations of the work, and indicated several spots on his own property where water existed, and also went over the ground across the road where the city council was boring for a supply for the abattoirs—a matter which is again referred to later on. He simply walks along with his arms by his side, his hands pointing somewhat behind, and when he comes on to ground over water he is seized with a trembling in the hands and arms, and the body bends as though he were being forced down by pressure on his two shoulders, till he stands on tiptoe. In some places the effect on him is more marked than in others—presumably owing to a greater or less body of water. If one holds Mr. Mason’s wrist while his body is undergoing this contortion, one can feel a sensation not unlike that received from one of those penny-in-the-slot electrical contrivances which are so popular at fairs. Asked if he felt any after effects, Mr. Mason said there was a strained feeling in the muscles of the legs after a big day—he has located over thirty spots on some days—and he could not sleep the night after, but experienced nothing unusual beyond that; and, if he found one or two places only, he felt no inconvenience whatever. It is only when he stretches his arms down in the manner referred to that he can tell when he is over water; and, taking this in conjunction with the fact that those who use the rod must naturally exert a certain amount of force to hold it, one comes to the conclusion that there must be a certain rigidity in the muscles of the upper part of the body before the finder answers to the force generated by the running water.

Mr. Mason believes that there is some connection between the width of the ground over which he feels the sensations set up by the water and the depth at which one may get the water. Take, for instance, the lower line marked

"surface" in the diagram. If he can be affected over an area of, say, 3 yards, and the water is tapped at 50 feet, then if he be affected over a greater area, as in the second line marked "surface," the depth at which this water will be found will be so much deeper in proportion. Of course, these figures are purely supposititious.



Some very interesting phenomena are met with now and again in the course of the work. While a bore was being put down at Mangere, the men, after going through scoria for a considerable distance, came across a buried tree (which was afterwards proved to be kauri), and struck a grand flow of water. Many, many centuries ago there must have been a forest there which was buried by some eruption, all the country round about being volcanic. At Mount Wellington, while looking for water for the road board, Mr. Mason found an enormous body of water right in the middle of the scoria pit which is now being worked, and that hundreds of small streams radiated from this centre all round the mountain. His investigations also proved to him that Lake St. John—about whose source there have been frequent discussions—was fed from Mount Wellington, as he traced the course of the underground streams from one to the other. On one occasion Mr. Mason located water for a man in the Waikato, and heard no more about it till one day a messenger came asking advice, as they were in difficulties with the bore. Water had come in intermittently when they had reached a depth of 184 feet, but they had gone down 350 feet without success; and, as it was getting beyond their means, would Mr. Mason tell them what to do? He replied that there was evidently some obstruction at the 184 feet, and advised putting in a charge and blasting at that spot. The man was canny, and did not like to blow away all the work of weeks, so he put in a charge at the bottom of the bore. No result. He put in another higher up. Still no result. Finally, he exploded a charge at 184 feet, and the water at once came in with a splendid flow.

General Notes.

TANNING HOG SKINS.

AMERICAN METHOD.

Hog skins make very nice leather when they are properly tanned. They are usually very greasy, and have numerous holes in them. It is very important that the tanner handles the skins carefully, so as not to increase the number of holes; and the skins must be degreased right at the start, as they will cause trouble all the way through.

The skins should be worked before they are soaked, and as much of the grease as possible must be scraped out. After the skins have been scraped out dry, they should be washed in warm sal soda water, and then worked and scraped to get the dissolved grease out. The soda solution is made by dissolving 5 lb. of sal soda in a barrel of water of about 95 degrees. The skins are put into this water, and left there about one minute; they are then put on the beam, and scraped and worked, and the dissolved grease will flow out. After this has been done at least twice, the skins should be washed in soda solution to free them from adhering grease, and then soaked for twelve to twenty-four hours in cold water. The unhairing is accomplished most readily in a solution of sulphide of sodium or patented depilatory. Fleshing should be done before the skins are unhaired.

DEPILATORIES.

A suitable depilatory is made by dissolving 10 lb. of depilatory in each 7 gallons of water in the vat; the skins are then put into the solution and stirred about for thirty-six hours, more or less, or until the hair is dissolved and the skins are ready for the lime. Wash the hair off, and then lime the skins in weak, white lime for one day; and then transfer them to stronger lime, or make the first lime stronger. From two to four days are usually required by the liming process, according to the thickness of the skins and the strength of the lime. The lime dissolves the remaining grease, and the bathing and washing remove it. A bran bath is good for drenching the skins: 50 lb. of bran soaked in warm water until it is sour and then stirred into 700 gallons of water makes a good drench for the skins; 10 lb. of sulphuric acid should be added to the drench, and the skins stirred about in the liquor for several hours until they are soft and clean.

The next work is fine hairing, and the skins should be worked out over a beam; and all the lime, dirt, and oil should be removed on the flesh side, and the skins are then ready to be scudded upon the grain. This work must be carefully done so as not to damage the grain. All the dirt and fine hairs should be removed from the grain; the skins then rinsed in warm water, and they are then ready to be tanned. On account of their porous nature, the skins absorb the tan very rapidly. Hemlock extract is the cheapest tanning material that can be used; quebracho extract tans the skins with a fine, natural grain; and a combination of the two also makes good leather.

THE TANNING PROCESS.

A paddle vat is the best to do the tanning in, as a drum is apt to tear the skins. When hemlock is used, the skins are kept in the liquor until they are struck through, the liquor being strengthened twice a day. About eight days are required to do the tanning. After they are tanned, the skins should be bleached and drummed in sumac, then washed, struck out, oiled lightly, and dried. Dampen the dry skins, and shave those that need it. Have the skins

moist and soft and give them fat liquor made of oil, soap, and degreas; give considerably less fat liquor than calf skins, and then dry the skins again. If the skins are to be coloured, moisten them with warm water, and clear the grain with borax and sulphuric acid or any other good bleaching process, and then mill in sumac again; rinse the leather, and colour it in a drum the desired shade; rinse the skins again; oil the grain with cod oil, and dry the skins again. Staking and finishing complete the work, and the skins are ready for use.

TANNING BATHS.

To tan with quebracho, make up the first tanning bath by adding dissolved quebracho extract to water in the paddle vat to make a 4-degrees liquor. To each 100 gallons of liquor add $1\frac{1}{2}$ lb. of alum and 4 lb. of salt, and plunge the liquor well. Process the skins in this liquor for thirty-six hours, or until they have assumed a light oak colour; then place them in the second bath. This is simply a clear quebracho liquor of 6 degrees. Paddle the skins in this liquor thirty-six hours; then strengthen the liquor to 10 degrees; and in about two days the skins will be completely tanned. Drum the skins in sumac; oil the grain with neat's-foot oil, and hang the skins up to dry or tack them on frames. The dry skins can then be moistened, coloured, and finished. They can also be bleached and finished without being coloured. Hemlock combined with quebacho makes a good tannage. For inner-soiling, the skins are oiled with a combination of fish and mineral oil, and are finished on the rolling machine, which makes them smooth and firm. It is of benefit to the leather to mill the skins in a lactic acid solution before tanning them; it clears the grain.—“Indian Trade Journal.”

Answers to Correspondents.

PINEAPPLE-GROWING.

NOVICE, Nudgee.—

“Novice,” as a beginner in the business of pineapple-growing, asks the following eight questions:—

1. How long a time elapses between the planting of suckers and the first production of marketable fruit?

Ans.—From 12 to 20 months (except where suckers throw fruit as soon as planted), according to the type of suckers, and the time of year when planted.

2. How long between the first appearance of fruit on the sucker and its readiness for market—summer and winter?

Ans.—Rough Leaf, about 4 months in summer—5 months in winter; Ripley Queen, about $4\frac{1}{2}$ months; seedlings, about $4\frac{1}{2}$ months.

3. How long between first fruit and subsequent fruit from the same stock?

Ans.—The stock which has borne a fruit will bear no more. The subsequent fruits follow from the suckers.

4. Should the buttons that grow on the stalk beneath the fruit be removed when the fruit is gathered? If so, why?

Ans.—Some plant the buttons from the common, or Rough Leaf; but these are of no value for planting for a marketable product. Buttons from Smooth and Ripley Queen pines are better for planting than strong plants, as the first fruit from the buttons is marketable, whilst that from the sucker is not.

5. If buttons are allowed to remain on the stalks, will they bear fruit, and at what period?

Ans.—Remove them, plant them out, and they will bear in two years.

6. Which are best for planting purposes—suckers, tops, or buttons; and how long between planting and bearing of each?

Ans.—Suckers are the best in the case of Rough Leaf pines. Tops will, it is said, produce better fruit; but it takes two years and more before they fruit. Buttons, except those above mentioned, are not worth planting.

7. Is the mealy bug really detrimental to the fruit? What means should be taken to combat it

Ans.—The mealy bug does no harm to the fruit; but it should be brushed off before marketing the latter.

8. What is the best manure for pines, how should it be applied, what season of the year is best, and how often?

Ans.—The best manure for pineapples is stable manure. If this is not obtainable, the best results will be obtained from a complete manure containing at the rate of 150 lb. of pure potash, 75 lb. of nitrogen, and 75 lb. of phosphoric acid to the acre. Bonedust by itself, applied at the rate of 1,000 lb. per acre, shows no results at first, as it is a slow-acting manure. Nitrogen is of vital importance. Green manure (cowpeas) may be ploughed in, and suckers planted the next season. Shirley's, Graziers', and Redbank manures may be applied about August, and again after the summer crop is off, to give good growth during the autumn and winter. Plough in.

We do not know of any special work on pineapple-growing in Queensland. Mr. A. H. Benson's articles in this Journal and his pamphlet on fruit culture here contain all that is needed by the novice.

Plant smooth-leaved pines in rows $4\frac{1}{2}$ feet apart every three years. They do not spread like the rough-leaved.

THE CULTIVATION OF GROUND OR PEA NUTS.

OIL, Rockhampton.—

You will find full information on peanuts in the Journal for May, 1904, and June, 1905. A very interesting account will be found, in the issue of July, 1899, of a farmer's experience in raising peanuts, by the late Mr. Charles Batten, of Pimpama.

STOMACH WORMS IN SHEEP.

R. IRVING KEYS, Biggenden.—

Grazing sheep on lucerne will tend greatly to reduce the number of stomach worms; but the ground should not be overstocked, nor the animals grazed on it continuously. It should, however, be borne in mind that green lucerne has a slightly costive effect, and with animals badly affected with stomach worms food of a dry nature is indicated.

STALLION TAX.

P. CLARKE, Ashgrove.—

There is no tax on stallions. You may safely castrate an entire even up to ten years of age. A horse-breeder says, however, that the operation should not be performed when thunderstorms are about.

The Markets.

PRICES FOR FRUIT—ROMA-STREET MARKETS.

Article.	AUGUST,	
	Prices.	
Apples, per case	...	
Apples (Hobart), choice, per case	11s. to 12s.	
Apples (Hobart), medium, per case	7s. 6d. to 9s.	
Apples (American), poor quality, per case	6s. to 8s.	
Apples, New England, per packer	...	
Apricots, Local, per packer	...	
Asparagus (Westbrook State Farm), per dozen bundles	8s. to 9s.	
Bananas (Queensland), per dozen	3d. to 4½d.	
Custard Apples, per case	...	
Gooseberries, per quarter-case	...	
Lemons (Lisbon), per case	6s. 6d. to 8s.	
Lemons, rough, per case	...	
Loquats (Sydney), per case	6s. to 6s. 6d.	
Mandarins, per case	4s. to 5s.	
Oranges, Queensland, per case	4s. to 5s.	
Passion Fruit (Sydney), per case	4s. to 5s.	
Papaw Apples, per quarter-case	2s. to 2s. 6d.	
Persimmons, per case	...	
Pineapples, rough, per dozen	1s. to 1s. 6d.	
Pineapples (Ripley's), per dozen	1s. 6d. to 2s.	
Pineapples, smooth, per dozen	...	
Rosellas, per sugar bag	...	
Strawberries, per tray	2s. to 3s.	
Strawberries, per dozen cardboard boxes	5s.	
Tomatoes, per quarter-case	4s. 6d. to 6s.	

SOUTHERN FRUIT MARKET.

Apples, American, per case	11s. 6d. to 13s. 6d.
Apples, Tasmanian, per case	12s.
Apples, Tasmanian, Cooking, per case	...
Bananas, Fiji, Gros Michael, per case	18s.
Bananas, Fiji, sorts, per case	24s.
Bananas, Fiji, ordinary, per case	15s. 6d. to 16s.
Bananas, Fiji, per bunch	3s. to 7s. 6d.
Bananas, Queensland, per case	11s. to 12s. 6d.
Bananas, Queensland, per bunch	2s. 6d. to 5s.
Chillies, per bushel	...
Custard Apples, per case	...
Gooseberries, per quarter-case	...
Loquats, per case	4s.
Mandarins (Local), per case	10s.
Mandarins, Emperor, per case	...
Oranges, Queensland, per case	...
Oranges (Local), per case	10s.
Oranges, Queensland, Navel, per case	14s.
Passion Fruit, per half-case	4s.
Pears, Victorian, per case	20s.
Pears, Tasmanian, per half-bushel case	...
Pineapples, Queensland (smooth), per dozen	...
Pineapples, Queen's, per dozen	4s. to 5s. 6d.
Pineapples (Ripley's), per dozen	4s. 6d. to 6s.
Pineapples, Queensland, common, choice, per dozen	...
Strawberries, Queensland, per three-quart tray	...
Strawberries, Queensland, small, per three-quart tray	...
Tomatoes, Queensland, choice (coloured), per box	3s. to 5s.
Tomatoes, green, per quarter-case	...

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR
SEPTEMBER.

Article.							SEPTEMBER.
							Prices.
Bacon, Pineapple ...	...	...	...	...	...	lb.	7½d. to 9d.
Barley, Malting ...	...	...	...	...	...	"	...
Bran ...	...	...	...	...	...	ton	£7 to £7 5s.
Butter, Factory ...	...	...	...	...	...	lb.	1s. 1d.
Chaff, Mixed ...	...	...	...	...	...	ton	£4 10s. to £5 10s.
Chaff, Oaten ...	...	...	...	...	...	"	£6 15s. to £8 10s.
Chaff, Lucerne ...	...	...	...	...	...	"	£4 to £6
Chaff, Wheaten ...	...	...	...	...	...	"	£5
Cheese ...	...	...	...	...	...	lb.	9d. to 9½d.
Flour ...	...	...	...	...	...	ton	£9 15s.
Hay, Oaten ...	...	...	...	...	...	"	£9
Hay, Lucerne ...	...	...	...	...	...	"	£2 10s. to £4 10s.
Honey ...	...	...	...	...	...	lb.	2d. to 2½d.
Maize ...	...	...	...	...	...	bush.	4s. to 4s. 1d.
Oats ...	...	...	...	...	...	"	3s. 9d. to 4s. 3d.
Pollard ...	...	...	...	...	...	ton	£7 to £7 5s.
Potatoes ...	...	...	...	...	...	"	£6 5s. to £10
Potatoes, Sweet ...	...	...	...	...	...	"	...
Pumpkins ...	...	...	...	...	...	"	...
Wheat, Milling ...	...	...	...	...	...	bush.	4s. 9d. to 5s.
Wheat, Chick ...	...	...	...	...	...	"	4s. 9d. to 4s. 10d.
Onions ...	...	...	...	...	...	ton	£10 10s. to £15
Hams ...	...	...	...	...	...	lb.	10½d. to 1s. 1d.
Eggs ...	...	...	...	...	...	doz.	7¼d. to 8d.
Fowls ...	...	...	...	...	...	pair	3s. 1d. to 5s.
Geese ...	...	...	...	...	...	"	6s. 3d. to 7s.
Ducks, English ...	...	...	...	...	...	"	4s. 3d. to 5s.
Ducks, Muscovy ...	...	...	...	...	...	"	4s. 6d.
Turkeys (Hens) ...	...	...	...	...	...	"	6s. 9d. to 7s. 3d.
Turkeys (Gobblers) ...	...	...	...	...	...	"	12s. to 14s. 6d.

ENOGGERA SALEYARDS.

[illegible]

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR
AUGUST—*continued*.
EXHIBITION.

Animal.							AUGUST.
							Prices.
Bullocks (Champion)	...	...	...	...	...	...	£21 10s.
" (Guessing)	...	...	...	...	...	...	£18 15s.
" ...	...	...	...	...	...	...	£15 10s.
Cows (Champion)	...	...	...	...	...	...	£11
" ...	...	...	...	...	...	...	£9
Merino Wethers	...	...	...	...	...	...	26s. 6d.
C.B. "	...	...	...	...	...	...	30s.
Merino Ewes	...	...	...	...	...	...	17s. 6d.
C.B. "	...	...	...	...	...	...	24s.
Lambs	...	...	...	...	...	...	18s. 6d.

Orchard Notes for November.

By ALBERT H. BENSON, M.R.A.C.

THE SOUTHERN COAST DISTRICTS.

November is somewhat of an off month for fruit, as the crop of strawberries is about over; pineapples, with the exception of a few off season fruit, are not ready for marketing; and citrus fruits of all sorts, with the exception of those grown in the latest districts, are now over.

Bananas should, however, be improving, particularly if the season is favourable.

The most important work of the month is the cultivation of the orchard, as, in order to retain moisture in the soil, it is essential that the soil be kept in a fine state of tilth. Where land is liable to wash, breaks should be left between the fine-worked land, or, even better, a good break of cowpea or other leguminous crop, valuable for producing nitrogen and humus, should be grown. All fruit pests should be attended to; cyaniding can be carried out where necessary, and is especially useful now in the case of the Red, Purple Mussel, Circular Black, and Glover Scales. Fruit fly should be systematically fought; all imported plums, peaches, guavas, or other fruits should be gathered and destroyed, so as to prevent the spread of the pest. Sucking bugs of all sorts should be gathered and destroyed, the egg clusters, as well as the immature and mature insects, being destroyed. Hand-gathering is as good a plan as any. Fig beetles should be destroyed by spraying with Kedzie's mixture; and the egg clusters should be destroyed whenever found.

Bananas and pineapples can be planted during the month, taking care, in the case of pineapples, not to set out suckers that will immediately throw out a fruit, but those that will become firmly established before they fruit. Examine the vineyard carefully, and keep it well worked. Look out for Oidium and Black Spot, and treat for same as recommended in the Orchard Notes for the two previous months.

Early ripening grapes will be reaching maturity towards the end of the month; but few, if any, will be ripe. In any case do not market too immature fruit; rather wait a few days longer, till it is fit to eat.

TROPICAL COAST DISTRICTS.

The main crop of pineapples will ripen during the month; and if gathered at the right time—viz., when fully developed, but not turned colour—they will carry all right South, if carefully handled and well packed. Pawpaws and granadillas are still in season, and will meet with a good Southern demand; they must be packed in cases containing only a single layer of fruit, and should be sent in the cool chamber. I am certain that a good market can be got for these fruits in both Melbourne and Sydney, particularly at this time of year, when their winter fruits are off and their summer fruits are not yet on.

Watch bananas carefully for fly. Keep the orchards well cultivated.

Only ship good mangoes South; far too much rubbish is sent to Brisbane. Good mangoes will pay to pack properly, but the common sorts, which predominate to an enormous extent, will barely pay freight, if there is a good crop. The canning of good types of fibreless mangoes of good flavour is well worth taking up commercially in the North, as a ready sale for the canned fruit can be obtained.

As in the Southern Coast districts, all fruit pests should be systematically fought, and the orchard should be kept in a good state of tilth, as, once the wet season starts, there is little chance of cleaning up weeds and rubbish of all kinds, or of cultivating and sweetening the soil.

SOUTHERN AND CENTRAL TABLELANDS.

The earlier kinds of summer fruits, such as cherries, will ripen during the month. See that, if fruit fly makes its appearance, it is systematically fought.

Look out for Codlin Moth, and continue the sprayings with Kedzie's mixture.

Look out carefully for any San José scale that may have escaped the winter spraying, as, if the trees are sprayed whilst the young are hatching out, the bulk of the insects are killed, and little damage is done either to the tree or fruit.

The sulphide of soda spray is one of the best to use now. Keep Woolly Aphis in check, should it make its appearance, using the resin washes; or, if it and San José Scale are both present, use the sulphide of soda spray.

Watch the vineyards carefully for Black Spot and Oidium. Keep the orchard and vineyard well cultivated, so as to retain all the moisture in the soil required for the growth of the tree and development of the fruit. In the warmer parts, irrigate when necessary, following the irrigation by deep and systematic cultivation.

See that grape vines have plenty of foliage to protect the ripening fruit from sun scald, but yet not so dense a foliage as to induce Oidium or Black Spot. Look out for Red Scale on citrus trees, and cyanide to check same. Look out for fruit fly in the early ripening fruits, and gather and destroy all that may be so affected.

Farm and Garden Notes for November.

FIELD.—Under ordinarily favourable conditions, harvesting the wheat and barley crops may now begin. Those who have oats for hay should cut it when the grain has formed, but before it is ripe; for then the plant is in its most nourishing condition. Destroy caterpillars on tobacco plants, and top the latter so as to throw all the strength into the leaves. Keep down the weeds, which will now try to make headway; earth up any growing crops requiring the operation; sow maize, imphee, setaria, Kafir corn, teosinte, sorghum, &c. Plant sweet potatoes, sisal hemp, yams, peanuts, and ginger.

KITCHEN GARDEN.—Why do so few gardeners and farmers grow their own vegetables? This is a question frequently asked by visitors to the farming districts. The reason probably is, that vegetables require a good deal of care and attention, which means also a good deal of time taken from the ordinary farm work. In many cases it pays the farmer better to buy many kinds of vegetables than to grow them himself. The only vegetables grown on many fine farms are cabbages and pumpkins, not to class potatoes under the head. Many people have an idea that European vegetables cannot be grown during the hot summer months, but this is a great fallacy; the Chinese gardeners supply the towns with all kinds of vegetables, except, perhaps, cauliflowers, during the whole of the summer. It is, therefore, clear that, by constant work, plenty of manure, water, and some shade for seedlings, most vegetables can be produced during the hot months from November to March. If your ground has been trenched or deeply dug and well worked, the advantages will be seen during the coming months. It does not pay to work shallow-dug ground. When sowing and planting during this month, give plenty of room between the rows and the plants; otherwise they will be drawn up and worthless, and keep the ground open by constant forking and hoeing. Thin out melon and cucumber plants. It is a good plan to peg down the vines; they will then not be blown about by the wind; they will take root at intervals, and thus help the main stalk. Give plenty of water to tomatoes planted out last month. They should also be mulched. Sow cabbage, French beans, melons, lettuce, radishes, pumpkins, cucumbers, marrows, rosellas, &c.; and transplant for succession in calm, cloudy weather.

FLOWER GARDEN.—Stake any dahlias which may be now above ground, and plant out the bulbs which were stored in a moist place. If the weaker bulbs are reserved, they will come in for autumn planting. Take up all bulbs which have done flowering, and store them in a dry place. Winter-flowering plants will have gone off almost; still, the garden should be in full bloom, and will well repay the trouble bestowed on it, and a little fertiliser given as a top-dressing will assist the plants to bloom and look well for a longer time than if they were neglected. Give weak liquid manure to chrysanthemums, and allow no suckers to grow till the plants have done flowering. Take up narcissi. Do not store them, but plant them at once in new situations. Sow antirrhinum, balsam, zinnia, summer chrysanthemum, calliopsis, and nemophila.

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It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

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Agriculture.

DEPASTURING WHEAT FIELDS.

A warm and rainy autumn and an early winter are certain to induce a too luxuriant growth of wheat, which is likely to be followed by damage from frost and the exhaustion of the wheat plants long before harvest time. For the purpose of correcting this tendency to overgrowth nothing can equal close cropping by sheep. Next to sheep calves do this work most efficiently, whilst adult cattle and horses, because they pull up so much wheat and otherwise damage the field by "poaching up" the ground, are, for this purpose, least useful of all. A too rampant growth of wheat is often corrected by the timely use of the mowing machine, but whether stock or the machine are employed, it is imperative that the work be undertaken in time. These remarks should, therefore, be noted by young wheatgrowers next season. If the wheat is cut back or eaten back after it has begun to send up seed stalks, it will be found that the plants have not the residuum of strength required to make a second strong growth and an ultimate crop. There are not many wheatfields in Queensland that will not be greatly benefited by allowing sheep to range over them freely during the winter months. These frequent grazings stimulate the tillering impulse of the wheat, cause it to get a deeper and firmer hold of the soil, and force it to conserve its energies ready for the demands of the later stage of growth. Those who have no sheep might borrow a neighbour's flock for use on their wheatfields with great advantage to both borrower and lender.

IMPROVING THE TOBACCO PLANT IN AMERICA.

The Bureau of Plant Industry of the United States Department of Agriculture has mapped out an interesting programme of tobacco experiments for the coming season that should result in much valuable data being secured (says "The Western Tobacco Journal" of 23rd March). The breeding of improved types of tobacco, fertilisers, and rotation experiments, investigations of the curing and fermentation processes, methods of judging and testing tobacco, and the relation of the composition to the burn, aroma, and other characteristics of the leaf, are all included in the season's work. During 1908 experiments will be conducted in Connecticut, New York, Ohio, California, Maryland, Virginia, Kentucky, Tennessee, Florida, Alabama, and Texas.

Chief B. T. Galloway, of the Bureau, has given out the following details of the proposed investigation :—

The work in the Connecticut Valley will be conducted in conjunction with the Connecticut Agricultural Experiment Station, and will consist of the further improvement of the hybrids and strains of the native Connecticut Havana and Broad Leaf varieties by seed selection and breeding. Tests on a commercial basis will be made of the hybrids and strains which have been found to be valuable for cigar wrapper manufacture.

TO IMPROVE SHADE VARIETIES.

Efforts to improve the new varieties adapted for growing under shade will be continued, particularly the Cuban and Sumatra types previously obtained by breeding and seed selection. Selections of seed from plants resistant to this tobacco root rot, made the past season, will be tested in diseased fields the

coming season. Further tests will be made of the value of having vetch and other cover crops for tobacco lands. An acclimated strain of hairy vetch has been secured by breeding, and experiments will be undertaken the coming season to determine the best methods of producing vetch seed on a commercial basis.

Experiments will be continued for the purpose of devising means of controlling the conditions of temperature and humidity in the curing barns in order to avoid damage from pole burn and other causes. The steam steriliser for tobacco seed beds will be further tested in sections of the valley where fungus diseases have developed. The various experiments will be conducted in the East Hartford, Granby, and Suffield districts.

LABORATORY INVESTIGATIONS.

In addition to the field of experiments a laboratory is maintained at headquarters in Washington, where the judging and testing of the tobacco samples are carried out. In this laboratory new and improved methods for the systematic testing and comparison of the different tobaccos are being developed. By these methods reliable data are obtained for further improvements by breeding and selection. Another important feature of these laboratory investigations is the study of the relation of the composition to the important characteristics of the leaf, such as the burn, flavour, aroma, elasticity, colour, grain, and texture. Important results have already been obtained concerning the causes of good and bad burning tobaccos. Investigations on the chemical changes taking place during the fermentation of cigar tobacco are well under way.

TO STUDY FLAVOUR AND AROMA.

A problem intimately associated with these fermentation changes—namely, the nature and origin of the constituents instrumental in imparting the characteristic flavour and aroma—will be carefully studied. Along with the experiments in curing to be conducted in the Connecticut Valley with the object of determining the most favourable conditions of light, temperature, and humidity, careful study will be made of the chemical and physiological changes taking place in the leaf in this process. Another interesting and important problem which will be gone into thoroughly during the coming season concerns the relation of the nicotine content to the quality of the leaf. Finally, it is planned to make a study of the influence of the artificial shade on the important chemical and physical characters of the leaf.

ATTAR OF ROSES.

This delicious perfume, which at one time used to be sold at a guinea a drop, may be obtained as follows:—Gather a quart of rose leaves from fragrant roses after the dew is all off. Do not pick them soon after rain, as they are not so fragrant then. Put a layer of the leaves at the bottom of a wide-mouthed glass bottle, sprinkle with salt, and then cover with a layer of absorbent cotton made wet with pure olive oil, another thick layer of rose leaves, sprinkled with salt, and fill the bottle with alternate layers until the bottle is full. Tie a piece of oil-silk (double) over the top of the bottle; set it where the sun will shine on it all day for two weeks; then uncover and extract the oil from the cotton and rose leaves. It is superior to much of the perfumes which are sold.—“Australian Field.”

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

RECORD OF COWS FOR MONTH OF SEPTEMBER, 1908.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Peewee ...	Holstein-Sh'rth'rn	20 May, 1908	881	3·8	34·46	
2	Sue ...	Grade Shorthorn	25 May ..	665	4·5	33·51	
3	Rhoda ...	" ..	28 Mar. ..	582	4·2	27·37	
4	Grace ...	Shorthorn ...	30 May ..	664	3·6	26·75	
5	Hetty ...	Ayrshire-Sh'rth'n	20 Mar. ..	514	4·5	26·15	
6	Winnie ...	Shorthorn ...	8 April ..	606	3·8	25·75	
7	Glen ...	" ..	10 Feb. ..	454	4·9	24·87	
8	Remit ...	Grade Holstein ...	6 Aug. ..	652	3·4	24·82	
9	Lark ...	Ayrshire ...	6 June ..	541	4·0	24·25	With first calf
10	Carrie ...	Jersey ...	16 Jan. ..	484	4·4	23·81	
11	Lady Loch...	Ayrshire ...	14 June ..	527	4·0	23·6	With first calf
12	Nettle ...	Shorthorn ...	14 May, 1907	629	3·2	22·51	
13	Ethel ...	Grade Holstein ...	3 Sept., 1908	503	3·9	21·93	
14	Ruby ...	Ayrshire ...	21 July ..	513	3·8	21·8	
15	Cocoa ...	Jersey ...	10 Nov., 1907	460	4·2	21·62	
16	Nancy ...	Grade Shorthorn	7 May, 1908	531	3·4	20·22	With first calf
17	Mona ...	Grade Holstein ...	20 Oct., 1907	475	3·8	20·18	
18	Honeycomb	Shorthorn ...	23 Aug. ..	382	4·5	19·25	
19	Nellie II. ...	" ..	26 Dec. ..	491	3·4	18·69	
20	Patch ...	Grade Shorthorn	14 Sept. ..	410	3·8	17·42	
21	Cuckoo ...	Jersey ...	8 Mar., 1908	342	4·5	17·23	
22	Lalla ...	Grade Holstein...	28 July ..	414	3·7	17·13	With first calf
23	Lubra ...	" Ayrshire	5 June ..	446	3·4	16·98	" "
24	Madge ...	" Holstein	6 June ..	419	3·6	16·88	" "
25	Lucy II. ...	" Shorthorn	17 April ..	396	3·4	15·95	
26	Chocolate ...	Shorthorn ...	5 Mar., 1907	353	4·0	15·81	

During the month the herd was frequently changed to different small paddocks, and occasionally allowed to run on old lucerne fields.

WEANING PIGS.

The time of weaning pigs varies from eight to ten weeks old, as a rule ; they are sometimes taken earlier from the mother, and sometimes later, but the time mentioned is the most reasonable. It should depend a good deal on the time they have been feeding, and in the case of any that have been late before they commenced, they should be kept with the mother longer—in the summer time till they are nine weeks old, and in the cold weather till ten weeks old. They should then be good pigs and well able to take care of themselves, and, as a rule, will do as well without the mother as with her. The state and condition of the sow should also, in a measure, be a guide to weaning, as sows that are pulled down very weak have usually done extra well for their pigs, and the latter should be taken away in fairly good time ; on the other hand, if the sow is strong and well, and the pigs are doing well also, they may be left a while longer. Some sows suckle their pigs well until they are six or seven weeks old, and then are useless through the milk drying up, when they are best away ; but such sows should be rejected for breeding, as this fault will become worse the more litters they have. But if a sow has a cold, and gets off her stomach for a day or two, or is unwell through any cause, her supply of milk may be lessened ; she should not be rejected, as her milk will

usually return all right. It is when the sow is hardy and feeding well, and yet appears to have no milk about her, that it is a fault. A profitable sow should have as good a supply of milk as ever, when the pigs are nine to ten weeks old.

There are some sows faulty in other respects. For instance, they may have a large supply of milk, but of such inferior quality that the pigs, although they get sufficient, look poor and bad, and do not get on; these sows should be culled out. Some sows bring a numerous litter, but irregular in size, some being good-sized ones, and others not bigger than rats. It will soon be seen if the sow is at fault by the udder—that is, if the teats the small pigs suck from are light and do not contain much milk. The favourite sow should be the one that brings a good level lot of pigs. The first litter of a sow is nothing to go by with regard to numbers. Good breeders often bring two, three, and four at first, and afterwards turn out well.

The gilt (that is, the breeding sow, so called until it has left its first litter) should be judged by the way she suckles her first lot; if she brings only a few up well, it is all right; but, supposing she has five or six, part good pigs and part very small, she must not be looked upon favourably. If she brings, say, seven—six good level ones and one small one—then she may be set down as fairly promising; but seven or eight good, strong pigs is better.

A gilt's pigs, although they may not be so well grown as an older sow's, should look well on the skin when ready for weaning. A good gilt, if in fresh condition when she farrows and brings up seven or eight pigs or upwards, by the time the pigs are ready to take away, should be pulled well down, or she is not much good for business.

A sow is usually at her best from the second to the fourth or fifth litter; but there are exceptions to this rule. Some sows will bring up the pigs well for about two litters, and then gradually get worse; while others will bring up eight or nine litters without any apparent depreciation in suckling qualities. But it is advisable not to keep them on too long, for several reasons.

As soon as a sow begins to get her pigs small or unsizable, she had better be sold or fattened off, and even though she may do well for seven or eight litters, there is always more danger of an old sow having milk fever or going wrong when farrowing than a young one. Finally, a breeder should keep the sows on, whilst they do well, till they have had five or six litters, and then pass them out.

TO MAKE UP A RATION FOR DAIRY CATTLE.

To begin with, we must have a foundation for the ration, and this may consist of hay, corn-fodder, sorghum, or straw. In the case of cattle or sheep, we take, for each animal, about $2\frac{1}{2}$ per cent. of its live weight in this dry fodder. Now, to this fodder we must add so much of grain or other concentrated food as will bring the total to the required standard of quantity and quality. We will suppose that a dairyman wishes to compound a ration for his cows. The nutritive value of sorghum is 1 to 16, but the requirements of a cow will be met by a much narrower ration—viz., 1 to 5.4. Assuming that the cow weighs 800 lb., we have for the requirements of such a cow organic matter, 19.20 lb., containing protein, 2.0 lb.; carbo-hydrates, 10 lb.; fat, 0.32 lb. She will receive 5 per cent. of her weight in green sorghum daily—40 lb.—the dry matter of which quantity is 9.20 lb. Now to supply the needed protein or albuminoid and carbo-hydrates, 13 lb. of bran are needed, supplying 10.71 lb. of dry matter, 1.63 lb. of protein, 5.73 lb. of carbo-hydrates, and 0.37 lb. of fat, the sorghum furnishing, besides 9.20 lb. of dry matter, 0.32 lb. of protein, 4.90 lb. of carbo-hydrates, and 0.10 lb. of fat. This ration contains as few constituents as possible, and is given because farmers generally are not in a position to make up rations having a number of ingredients.

Following, however, are a number of rations suitable for cows :—

1. Sugarcane tops, 40 lb. ; bran, 9 lb. ; cotton seed meal, 4 lb.
2. Cowpea vines (green), 45 lb. ; maize (ground), 10 lb. ; brewers' grains, 20 lb.
3. Sweet potatoes, 15 lb. ; lucerne hay, 10 lb. ; bran, 10 lb.
4. Maize silage, 40 lb. ; lucerne hay, 10 lb. ; wheat bran, 6 lb. ; maize meal, 3 lb.
5. Fodder maize, 20 lb. ; hay, 6 lb. ; oats, 4 lb. ; shorts, 4 lb. ; oil meal, 2 lb.
6. Maize silage, 50 lb. ; maize stover, 6 lb. ; oats, 6 lb. ; malt sprouts, 4 lb. ; maize meal, 2 lb.
7. Lucerne silage, 30 lb. ; hay, 15 lb. ; wheat bran, 3 lb. ; maize meal, 3 lb. ; cotton seed meal, 2 lb.
8. Panicum hay, 10 lb. ; lucerne hay, 10 lb. ; wheat bran, 6 lb. ; oats, 6 lb.
9. Fodder maize, 20 lb. ; lucerne hay, 10 lb. ; oats, 6 lb. ; oil meal, 3 lb.

The total cost of 1, 2, and 3 is set down at 1s. 1d. respectively, but this is clearly arbitrary, and the cost must be taken for what it is worth, since there are no market prices set upon sugarcane tops and cowpea vines, and the price of maize ranges from 2s. to 4s. 6d. per bushel.

Protein or Albuminoids.—Under these names are included all the nitrogenous substances of the plant. In the animal, they undergo transformation into muscle, hair, horns, the solid matter of the blood and nerves, the curd (caseine) of milk, and the white of egg, the latter being almost pure albuminoid. All the class of leguminous plants, such as clovers, lucerne, cowpeas, &c., are, in plant and seed, rich in the albuminoids. The food that is richest in these has the largest feeding value.

Carbo-hydrates.—This is a term used to denote the sugars, starches, gums, and similar substances in feeding stuffs. Nitrogen free extract is also sometimes used as synonymous with sugars and starches. The carbo-hydrates constitute the greatest portion of the dry substance in feeding stuffs.

WONDERFUL PRICES FOR PIGS.

The "Australian Field" states that the market for pigs in Sydney, early in October, was very high. Messrs. Badgery Bros., Sydney, advised that they sold, amongst other lots, one pig at £7 6s. 6d., one at £6 17s. 6d., one at £6 10s., and others at £6 0s. 6d., £5 11s. 6d., and lower, according to size and quality. Messrs. Badgery Bros. sold, altogether, 163 pigs, which averaged all round, porkers included, £3 5s. 1d.

The breed of pigs which fetched such high prices is not stated.

PINEAPPLE CULTIVATION IN SINGAPORE.

The cultivation of pineapples in Singapore Island has taken larger dimensions than before, large tracts of country formerly occupied by secondary growth being now cleared and covered with pineapples. Great quantities of pines have been also brought into Singapore from the islands around.

The result of this immense crop has been that pineapples have been selling in town for 1 cent apiece, and up country at 5 for 1 cent—that is, about 20 for 1d. The tinning trade is now apparently entirely in Chinese hands. It is satisfactory to see in many of the pineapple fields cocoanuts or rubber being planted, as pineapple culture is by no means good for the land.—"Straits and Federated Malay States Agricultural Bulletin."

The Horse.

CORNS IN HORSES.

A corn, be it remembered, is not a tumour or a growth, it is merely a bruise of the sensitive foot under the horn of the sole. It shows itself by staining the horn red, just as a bruise of the human body shows a staining of the skin above it. To "cut out a corn" with the idea of removing it is simply an ignorant proceeding.

If a corn be slight, all that is necessary is to take off the pressure of the shoe, and this is assisted by removing a thin slice or two of horn at the part. When the injury is very great, matter may be formed under the horn, and, of course, must be let out by removal of the horn over it. Provided there is no reason to believe that matter has formed, a corn—*i.e.*, the bruised and discoloured horn—should not be dug out in the ruthless manner so commonly adopted. Cutting away all the horn of the sole at the heels leaves the wall without any support. When the shoe rests upon the wall it is unable to sustain the weight without yielding, and thus an additional cause of irritation and soreness is manufactured. The excessive paring of corns is the chief reason of the difficulty of getting permanently rid of them.

The simplest device for taking all pressure off a corn is to cut $1\frac{1}{2}$ inch of the inner heel of the shoe. With the three-quarter shoe a horse will soon go sound, and his foot will then resume its healthy state. The saying "once a corn, always a corn," is not true, but it is true that a bruised heel is tender and liable to bruise again, from very slight unevenness of pressure, for at least three months. All that is necessary is care in fitting and abstention from removal of too much horn at the part. Of course, when the degree of lameness is such as to suggest that matter is formed, the horn must be cut away, so as to afford an exit for it, but the majority of corns are detected long before the stage of suppuration has resulted from a bruise.—From "Hunting's Art of Horseshoeing."

SALE OF SUFFOLK HORSES.

Considerable interest has lately been awakened in this State by the introduction of the Suffolk breed of farm horses. It will, therefore, be worth while for those breeders and farmers who think well of this excellent farm breed, to note the following prices which were lately obtained in England, at the annual sale of pedigree Suffolk horses in June last, as recorded in "The Live Stock Journal," under the auspices of the Suffolk Horse Society at Ipswich. This sale was, perhaps, the most successful of the series in respect to prices made and the all-round quality of the animals catalogued. There was a very active demand for fillies and mares, while the geldings sold well. This sale was originally promoted to dispose of the Society's foals, the produce of free nominations to the leading sires for the year distributed amongst small farmers having Suffolk mares practically sound. The prizes for the foals entered were awarded prior to the sale, Mr. D. F. Smith and Mr. H. Overman acting as judges, and Mr. Horace Wolton as steward. First prize was awarded to Mr. Henry Hawes for a typical horse foal by Rendlesham P.S.; a nice filly foal by Redwald, bred by Mr. W. Thomson, second; and a

promising horse foal by Rendlesham Goldsmith, bred by Mr. W. Durrant, third ; while a horse foal by Berners Neptune, bred by Mr. C. B. Cowles, was reserved.

Mr. Alfred Preston, as usual, conducted the auction in conjunction with Mr. Fred Smith, secretary to the society. The number entered for the sale was seventy-four, and the following were some of the prices made :—

MARES AND FOALS.

	Guineas.
Filly foal, s. Redwald	25
Horse foal, s. Rendlesham P.S.	21
Horse foal, s. Rendlesham Goldsmith	23½
Horse foal, s. Smith's Saturn	30
Filly foal, s. Toller's Vicar	32
Horse foal, s. Rendlesham Goldsmith	23
Ruby, f. 1903, s. Smith's Prince Albert	39
Golden Belle, f. 1901, s. Pratt's Golden Grain	27
Filly foal, s. Bentley War Cry	36½
Smart, f. 1903, s. Sir Ralph Blois' Guardsman	51
Famous, f. 1900, s. Cook's Border Minstrel	54

MARES AND FILLIES.

Puck, f. 1905, s. Smith's Prince Albert	66
Boulge Dainty, f. 1901, s. Sir Cuthbert Quilter's Prince Wedge-wood	52
Rendlesham Virginia, f. 1906, s. Smith's Saturn	70
Rendlesham Depper, f. 1905, s. Rendlesham Toller	70
Rendlesham Smart, s. Pretymann's Lord John	48
Peggy, f. 1905, s. Smith's Saturn	75
Ashmoor Godiva, f. 1906, s. Boulge Monarch	61
Leader, f. 1898, s. Long's Hurts Upstart	46
Alberta, f. 1904, s. Smith's Prince Albert	54
Culpho Bess, f. 1906, s. Boulge Monarch	41
Dimple, f. 1896, s. Pratt's Eclipse	33

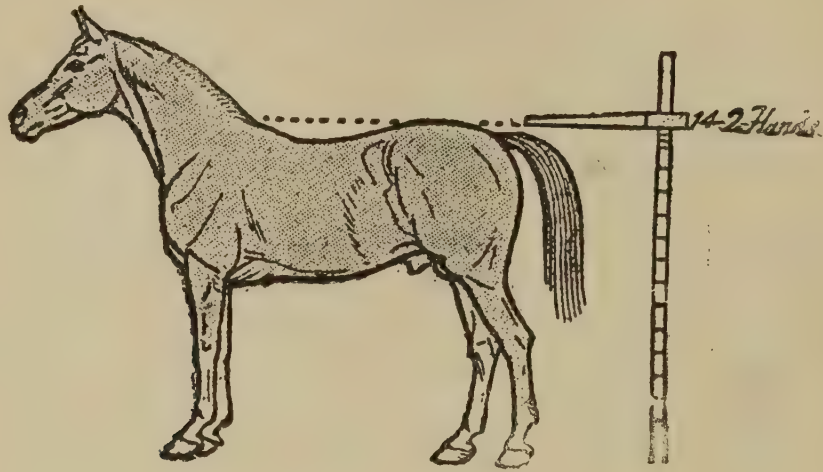
Geldings sold very well, three of them making 52 guineas, 58 guineas, and 48 guineas respectively. One stallion, Boulge Benedick, f. 1906, by Boulge Monarch, made 88 guineas, and another, Boulge Mercury, f. 1906, by Smith's Saturn, 52 guineas.

MEASURING POLO PONIES.

A NOVEL SUGGESTION.

A suggestion has been forwarded by a correspondent of "The Live Stock Journal," London, in regard to the future measuring of polo ponies. There has been a good deal of grumbling on the part of owners who have sometimes had ponies cast, owing to the animals possessing abnormally high withers, and although ponies in size and in every other respect, they could not get

them registered under the official standard. Our ("Live Stock Journal") correspondent suggests that two measurements should be taken, one at the withers and the other at the croup, and if these are added together and divided by two they will give the correct height. The idea being to obtain the correct size of the pony, and not the height at any particular part of the animal, the accompanying figure shows the suggested points of measurement:—



The suggestion has been submitted to a well-known London veterinary surgeon, and he states that croups higher than withers are common. A high-crouped pony measuring 15 hands and 14 hands 2 in. at the withers would pass, but under the "average" measurement would be rejected. Would not this lead to wider dissatisfaction than now obtains, he asks. There is, in his opinion, a much larger class of low-withered, high-crouped animals submitted for measurement than high-withered and low-crouped. Of course, says our correspondent, I hold this gentleman's opinion in high esteem, but surely this last remark wants a lot of swallowing.

A polo player writes us:—"As far as measuring polo ponies for the purposes of the game, I do not think that we are ever likely to improve on the method of measuring now in force. It may not be perfect from a show point of view, but that is not what it was originally intended for."

A gentleman with extensive experience of measurement writes:—"If the plan suggested for measuring the ponies at two points were adopted, and an average measurement arrived at by adding these two together and dividing by two, I estimate that an extraordinary divergence of size would be the practical result. There are a great number of ponies which are now produced for measurement which are much higher at the croup than at the wither. These ponies pass very easily on the wither measurement, but would be rejected upon the dual principle, and would lead to greater rejection than occurs at the present time, and to much more dissatisfaction. . . . It is very difficult to measure at the wither alone quite satisfactorily—not that the actual fact of measuring is difficult, but the difficulty lies in justly placing the pony, and getting it to maintain a fixed position while the measurement is effected. The difficulty would be more than doubled if two measurements were required, as to be correct they must be effected without the pony changing position. The present plan of measurement has its drawbacks, but they are nothing to what would occur if the dual measurement were put into force. The plan of the 'Live Stock Journal' correspondent would be very fair to just one class (a rather small class) of pony, the pony with an abnormally developed wither, but with a low back and croup. It would lead to the rejection of a large number of ponies which now measure satisfactorily at the wither, but which, being very high at the croup, would be cast out when the average is struck between the two measurements."

The Orchard.

EXPORTING MANGOES.

In a short time the Queensland mango crop, which promises to be a very large one, will be ready for harvesting. What is to be done with this fruit? Locally, it is impossible to dispose of the large quantities produced. It remains then to consider whether they can be exported to advantage. The mango, except in an unripe state, is a fruit which does not carry well unless great care is observed in packing. In an article with the caption, "A Queensland Opportunity," "The Fruit World" describes a so-called "Safety Export Fruit Case" for oversea and interstate fruit trade. The inventor of this case claims for it that it will ensure safe transit, will not damage, and cannot be pillaged. It is a basket box, $20\frac{1}{4}$ inches long, $9\frac{1}{4}$ inches wide, and $6\frac{3}{4}$ inches deep. Inside this a set of cardboard pockets is placed, in which the fruit is packed, each individual fruit thus having a ventilated compartment to itself. When the first or bottom layer is thus packed, a flat piece of cardboard is placed on top, making a complete division, then on this is packed another layer of fruit, and the lid nailed on.

The benefit is obvious. Safe transit is absolutely assured, the fruit cannot be damaged or pillaged. Fruit thus packed always brings top prices. This is the box which is recommended for mangoes, though, of course, any and every fruit may be sent in same. The cardboard "filler," which for some time the inventor has been consistently advertising, is a strip of cardboard just a fraction less than the inside measurement of the case. Thus for the basket box just mentioned, the size would be 20 inches by 9 inches by $2\frac{1}{2}$ inches. This is cut at regular distances, and another strip of cardboard also slit horizontally is placed transversely across same. The slits dovetail, and thus by placing these several pieces in position the box is divided into neat and regular compartments.

Now, the box under review would take fruit $3\frac{1}{2}$ inches long by $2\frac{1}{2}$ inches wide; or $3\frac{3}{8}$ inches long by $2\frac{1}{2}$ inches wide; or $3\frac{7}{8}$ inches long by $2\frac{1}{2}$ inches wide. This is called the 8-filler box, and holds approximately 24 lb. of fruit. A basket box of the same length and width, but only 6 inches deep, will take fruit proportionately in three sizes. Thus a grower using two of these remarkable cases would have compartments to suit six distinctly different sizes of fruit.

But that is not all. These are simply "stock" sizes, and if none of these are suitable for the mango, it is the simplest matter in the world to make fillers to suit. It only means cutting the slits in the cardboard at intervals, which fit the mango, and could be done as quickly as it takes you to read these words. Only let the maker know.

Yet once again with fruit such as grapes, it will be immediately seen that these smaller compartments are unsuitable, even regular-sized compartments might be unsuitable. In this instance, the inventor has ingeniously overcome the difficulty by making moveable compartments. For instance, the bunch of grapes would be put in the case, then a strip of veneer wood is placed round same, the ends of each pressing firmly against the two sides of the box, thus making the compartment any size required. This is repeated till the whole box is full. As regards mangoes, this latter method could be adopted with absolute security, and no waste of space.

But the chief difficulty that faces the Queensland grower at this juncture is the fact that these boxes are protected by patent. It would be more convenient to the Queensland grower for these cases to be made in Queensland rather than Melbourne. The cost of making them here is heavy owing to the tariff. But the difficulty is not insuperable by any means. The inventor is willing for the cases to be made in Queensland (where the timber is suitable, plentiful, and cheap), under a royalty. He is willing to supply prices to anyone making application, and considers the cost to the grower, with set of fillers complete (any size) would be only 1s. 2d. As the mango season is just opening, we cannot impress on our Queensland friends too strongly the need of getting in touch with this matter at once.

Apiculture.

BEES AND FRUIT.

From the hon. secretary of the Queensland Bee-keepers' Association we have received the following notes by Mr. D. Jones on the above subject:—

"While visiting a suburban gardener a few days since, complaint was made to me of bees injuring last year's crop of grapes. This matter cropped up some years ago at a meeting of the Brisbane Horticultural Society, when the matter was fully discussed, and a complete refutation given to the charge against our innocent bees.

That they do take advantage of what otherwise would be waste fruit juices is a fact which establishes a sound law in the economy of Nature; for bees will only avail themselves of such fruit juices as appear on fruits already punctured by other insect depredators, such as fruit flies, birds, &c.

In Queensland we often find, in certain seasons, grapes punctured by the fruit fly. This causes an exudation of juice which the alert bee is sure to seize on, with the result that he is charged as being the culprit originating the injury. Entomological study of the structure of the bee's mouth clearly demonstrates his inability to puncture or injure fruit by such a process.

In the case of fruit-fly attack, the bees render practical service in restricting the reproduction of the fly, as, by reason of the thorough manner in which the bees drain the injured grape of its juices, they leave only skin which will not sustain the larvæ, if developed from the egg, originally deposited by the fly.

Fruit-growers may well look upon bees as their most valuable allies, particularly in Queensland, where so many new varieties of fruits are being experimented with, dependent, as many are, on prompt and perfect pollinisation, which, without the aid of bees, could not be successfully accomplished.

In America some years since the question was fought out by an expensive lawsuit, when the verdict was emphatically in favour of our bee friends."

[The question of bees puncturing fruit has been frequently discussed in this Journal, and we showed by conclusive evidence that, as Mr. Jones says, not only does the bee not injure fruit, but that the insect is the greatest friend of the orchardist.—Ed. "Q.A.J."]

Horticulture

FLOWER GARDENING, No. 10.

By THE EDITOR.

PART II.

ANNUALS.

I have already made mention of a few desirable annuals, and will now devote a few pages to the consideration of others, together with biennials and perennials.

STOCKS.

Stocks, especially the double ones, are amongst the most popular and beautiful of our garden flowers, whether for pot culture or in beds or borders. They are valuable for cut flowers, and remain in bloom for a long time. A bed of stocks has a splendid appearance, and their perfume is delicious.

They are gross feeders, and, therefore, must be grown in good, rich soil, worked deep. Occasional waterings with liquid manure add to the size and beauty of the flowers.

The seed should be sown in pots or boxes, as it is then more under control than if sown in the open ground. When the plants are large enough to transplant, care should be taken to disturb the roots as little as possible.

In planting out stocks, many growers plant only the strongest and throw away the weakest as useless. This should never be done, as the weaker and smaller plants of a batch of seedlings almost invariably produce a larger percentage of double flowers. Seeds of the "Ten-week" varieties may be sown throughout the year, and the "Brompton" or biennial varieties in autumn.

"TEN-WEEK VARIETIES."

Dwarf German.—White and dark crimson. Giant Perfection.—Growth, pyramidal, with long spikes of beautiful large, double flowers. Snowflake.—A very effective wallflower-leaved variety. It is the earliest of the whites, and bears large spikes of snow-white flowers. Princess May.—Produces immense trusses of very large flowers of the finest shape, and of the purest, delicate, light primrose colour. Princess Alice.—Produces large spikes of pure white flowers of great fragrance.

WINTER OR "BROMPTON" VARIETIES.

Empress Elizabeth.—This is a splendid stock, which grows to a height of about 18 in. The plants throw up a very strong main stem, similar to that of a wallflower, and branch out in candelabra form. Both main and side stems are covered with large rose-shaped flowers of the brightest imaginable tint of carmine rose. The whole plant forms a grand pyramidal-shaped bouquet, the effect of which is enhanced by the bright green foliage, which is a feature of this variety. Beauty of Nice.—This is a remarkable variety, of a delicate shade of flesh-pink. It comes into bloom very quickly, quite as early as the ten-week varieties, and sends out numerous side-shoots covered with large and very fragrant flowers of nearly 2 in. across. There is an intermediate variety of these hardy annuals—viz., The East Lothian—a very fine race of stocks, attaining a height of 18 in.

WALLFLOWERS.

These well-known and much-admired hardy flowers will grow in almost any soil and situation, provided they get plenty of sunshine, which is always

possible in Queensland. Sow the seeds in a sheltered situation, in the open, from January to March, and transplant when the plants are strong enough to handle. In sheltered places the plants will rest during the summer, and bloom again during the following autumn and winter.

The double varieties are striking and handsome plants. The single varieties have a delicious perfume, and are hardy biennials.

BALSAMS.

These favourite annuals are so well known that little need be here said about them. They produce rose-like blooms of varied colours in great abundance, and remain in flower for a considerable time. Balsams are suitable for outdoor cultivation, and also make beautiful pot plants, and form striking objects for the decoration of the conservatory or greenhouse.

Many of the balsams obtainable from most nurserymen and seedsmen are notable for their large size, perfect doubleness, and symmetry of form, with the most brilliantly striking and exquisitely delicate and beautiful colouring. A first sowing should be made in August or September, and afterwards sowings up to February. The plants should stand at least 1 ft. apart, and water must be freely supplied in dry weather. They require a rich soil and plenty of sunshine. If the surface soil is mulched to a depth of 2 in., it will keep the ground moist, and also afford nourishment to the plants.

SOME GOOD VARIETIES.

Carnation.—Striped and flaked. Solferino.—Streaked and spotted. Camellia-flowered: Self flowers. Camellia-flowered: Benary's prize, and *Alba perfecta*. Rose-flowered, double.

DIANTHUS.

The dianthus, or, as it is sometimes called, the Chinese pink, adapts itself particularly well to our Queensland climate. It furnishes an abundance of beautiful flowers, and will continue to bloom all the year round almost, if all the old flowers and seed pods are regularly removed, and the flower-stalks which have borne flowers are cut out. When the plants run much to seed, they may be cut down to within 2 or 3 in. of the ground, when they will again bloom in the following year.

If sown during March and April, they will commence flowering early in summer, and continue to bloom freely throughout the autumn and well into the winter.

VARIETIES.

There are numerous beautiful varieties, Heddewiggi having the largest and most beautiful flowers. The improved forms of this section are remarkable for their brilliancy, diversity, and size of flower, and are worthy of special attention.

Hybridus, fl. pl.; *Imperialis*, fl. pl.; Double imperial pink; Mourning Cloak (Double), a charming variety of a very rich purple colour, of the finest double form; Eastern Queen (Single), immense single flowers, beautifully fringed, marbled, and suffused with carmine, rose, mauve, and lilac; Crimson Belle; *Atrosanguinea*, double variety, dark, blood red; *Chinensis* (Indian pink), resembles small carnations.

SWEET WILLIAM.

This is one of the biennials which should not be sown later than November, in order that the plants may become strong for transplanting with the first autumn rains, though the seed may be sown where the plants are to remain.

VARIETIES.

Barbatus produces large trusses of splendid colours. Auricula-eyed Sweet William is a distinct variety, very brilliant and beautiful. Harlequin Sweet William is a very large flowered, single variety dwarf; the flowers are of various shades.

CORNFLOWER.

The blue cornflower, so common in the English fields, is one of the most useful annuals in cultivation. It blooms during winter in profusion, and is most useful for cutting for bouquets in winter and spring. Sow during autumn and spring in boxes or seed beds in light sandy loamy soil. When transplanting, the plants should stand about 18 in. apart. Amongst the cornflowers (*Centaurea*) is included a very interesting family, the Sweet Sultans, which are fine sweet-scented annuals, growing to a height of 1½ to 2 ft.

SOME VARIETIES.

Nana compacta, blue dwarf; *Suaveolens*, yellow; Chameleon, yellow and rose; *Cyanus minor alba*, white; *Centaurea moschata* (Sweet Sultan), double, blue, purple and white; *Odorata* "Marguerite," white Sweet Sultan, large sweet-scented flowers; Emperor William, blue. The double variety may, to a certain extent, be compared to *Gaillardia Lorenziana*.

COSMOS.

This is an exceedingly beautiful autumn-flowering plant. The flowers are borne profusely in loose clusters, and present a charming appearance, embracing all shades of white, red, mauve, purple, and lavender, some being white, delicately tinted with pink and rose. There are also monstrous white flowers with flecked and serrated edges, and with pink and crimson flowers of the same type, the dark crimson flowers frequently resembling those of a large single dahlia. Plants of this variety are of strong free-branching growth, generally 6 ft. in height; the dense growth of finely-cut, dark-green foliage forms a splendid setting for the star-like flowers. If sown early in the spring, they will commence blooming in autumn, and continue to bloom into the winter. For bouquets and vases they are unsurpassed, lasting a long time in water. The large white variety is most valuable for florists.

SOME VARIETIES.

Cosmos bipinnatus, reddish lilac; *Cosmea bipinnata alba*, white; *C. bipinnata purpurea*, purple; *C. bipinnata rosa*, rose; *C. mammoth*; Perfection; New Giant; Red Star; the Pearl; Klondyke, yellow; *C. Marguerite*.

CANDYTUFT.

Candytuft is one of the most showy and effective annuals for beds, clumps, or borders. To obtain a heavy mass of bloom, the seed should be sown moderately thick, and, if transplanted, the plants should be set out 6 in. apart. The better plan, however, is to sow liberally and thin out to 6 in. Sow in autumn and spring.

SOME GOOD VARIETIES.

C. Empress and Carmine are the finest of all the annual varieties; the former bearing magnificent heads of pure white, and the latter has rich carmine flowers. White Spiral is remarkable for its vigorous growth, and large, pure white blooms, forming a very compact spike like that of the White Rocket. The fragrant Candytuft has gracefully cut foliage; *C. Little Prince* is a handsome new dwarf variety, producing large spikes of large, pure white flowers; Tom Thumb is a perfect dwarf cushion of snowy whiteness; Dwarf Crimson produces flowers of a rich, glowing colour. Other showy sorts are Rose Cardinal, with bright rose-carmine flowers; Queen of Italy, rosy white.

The white perennial varieties—*C. gibraltarica* and *Pruiti*—are charming plants, the latter being very useful for pot cultivation.

ANTIRRHINUM.

Under the name of "Snapdragon," this hardy and beautiful perennial is widely known and highly appreciated as an undoubted acquisition to the flower garden. The plant produces long spikes of flowers in endless variety of colour—self colours, stripes, and spots. The blooms are large, of beautiful form, and closely set on the stem. Plants are easily raised from seed, which may be sown in autumn or spring. They will succeed in almost any soil, but will be greatly improved by being grown in rich, light soil, well manured. The Tom Thumb varieties are charming for dwarf beds and edgings.

In the tall varieties, the flower spike runs to a height of 18 in. to 2 ft. The dwarf kinds rarely exceed 9 in.

VARIETIES.

Antirrhinum majus, coral red; *Antirrhinum majus*, Fire King, rose with orange; *Antirrhinum majus*, Romeo, deep rose; Queen Victoria, white; Brilliant, scarlet, golden and white. *Antirrhinum nanum* (dwarf): Queen of the North, pure white; The Bride, pure white; Black Prince, nearly black; Tom Thumb, various colours, very attractive. •

CAMPANULA (Canterbury Bells).

This is a genus of exceedingly beautiful perennials, all of which are characterised by the richness of their colours and profusion of bloom, which render them most desirable for the decoration of the garden. The large bells of the pure white variety are especially handsome, and should never be omitted in decorative gardening, as they afford a marked contrast with most other flowers. They can be easily raised from seed. Sow in a frame or box, and plant out later in the border. Sow in autumn or spring.

VARIETIES.

Campanula mirabilis, a new variety with pale blue or lilac flowers; *C. pyramidalis*, white and blue; *C. carpatica*, bright blue; *C. Calycanthema*, with charming saucer-like outer petals, colours various; *C. Persicifolia grandiflora*, Peach-leaved Campanula, white.

DIGITALIS (Foxglove).

Foxglove is a well-known and favourite flower in the Southern States, but is rarely seen in gardens on the coast lands of Queensland, and where it has been grown, although the plants thrive well, yet they did not flower. On the other hand, they do well on the cool table-land at Toowoomba and Warwick, where they are acclimatised. Foxglove is very easy of cultivation, however; so it is worth anyone's while to persevere with it. When in flower it is a very striking and showy plant, and requires plenty of space. It is one of the hardy perennials. Sow in spring and autumn.

VARIETIES.

Digitalis gloxinoides, a superb variety of various colours; Ivory's spotted, beautifully spotted.

ZINNEA.

A class of annuals of great beauty and brilliancy. It is of a branching habit. There is, perhaps, no class of annual flowers which has been so much improved of late years as the double-flowered Zinnias, which may now be considered as almost perfect. They flower throughout the entire summer, and always do best when transplanted. The flowers, which are large and perfectly double, range in colour from white to the most intense scarlet, orange, rose, salmon, purple, &c. Considering their very easy culture, they should be largely grown in every garden. Although very hardy when well established, they are at first tender, and should, therefore, not be sown in the open ground until September, when frosts are not likely to occur. In cold districts they should be sown some weeks later.

When the young plants are 2 or 3 in. high, they may be transplanted to about 18 in. apart, and should be stopped by pinching off the points of the main shoots when about 9 in. high, to induce a compact bushy growth. Zinnias are valuable for their beauty and for the long time they remain in bloom. The numerous varieties form splendid beds or patches, but the flowers being rather coarse in texture should not be too near the eye.

VARIETIES.

Giant, double-striped scarlet and gold ; Zebra, or striped, produces handsome striped double flowers ; Queen Victoria (double giant white), a pure white variety, with flowers measuring 4 in. across ; New Giant (*Grandiflora robusta*) produces perfectly double flowers of immense size—5 to 6 in. across—of the most brilliant and beautiful colours. Other desirable varieties are Tom Thumb, Double Pompon, Dwarf double, &c.

CALLIOPSIS.

This is a very showy class of annuals of almost every shade of yellow, orange, and rich brown, finely marked. It is a very beautiful plant in the garden, and is not at all particular as to soil. It is very effective in beds and borders, remains a long time in bloom, and is valuable for cut flowers. The seed should be sown in autumn and spring, and when the plants are large enough to handle plant them out quite 2 ft. apart.

VARIETIES.

Drummondi, yellow, with crimson centre ; *Bicolor hybrida*, double flowers, yellow and maroon ; *Atropurpurea*, rich, brownish crimson ; *Marmorata*, maroon, crimson splashed ; *Grandiflora*, bright golden yellow ; *Callirhoe pedata*, rosy purple, with white eye ; *Atkinsoni*, yellow and brown.

CLIANTHUS (Sturt's Desert Pea).

The Desert Pea may justly be reckoned amongst the most beautiful of our native flowers. It is a native of the driest portions of Southern and Western Australia. The flowers are brilliant crimson, about 3 in. long, and in the centre there is a large clear black marking. It is a trailing biennial plant, a little difficult to raise ; but it richly repays all trouble spent on its cultivation. The most suitable soil for the *Clianthus* is a sandy one, but it will also thrive and bloom on ordinary good loam. The best time to sow the seed is from July to the end of September, care being taken to select a sunny situation.

This Desert Pea is known as *Clianthus Dampierii* (Parrot's Beak).

Puniceus, the Glory Pea, is a very handsome perennial shrub, resembling the above, but more erect of habit. It bears a crimson flower.

GAILLARDIA.

The Gaillardias are hardy annuals and biennials, producing beautiful single and double flowers, which are very attractive and showy. They make splendid bedding plants, and are remarkable for the profusion, size, and brilliancy of their flowers. Sow in autumn and spring.

VARIETIES.

G. amblyodon bears fine deep-red flowers ; Josephus, scarlet with yellow bands. *G. grandiflora compacta* forms round bushes 12 to 15 in. high, and bears long-stemmed flowers perfectly upright, colours rich and varied. *G. pieta Lorenziana* ; this new double Gaillardia is a splendid bedding plant, the flowers are double, yellow, and deep crimson. *G. grandiflora maxima kermesina splendens* bears immense flowers, 4 in. across on long, stout stems, with a rich crimson centre, bordered with canary yellow. *G. Lorenz's Perfection* : The quilled petals are produced in such great abundance that they can hardly find space enough for development, thus giving to the flower the shape of a regular full bloom.

Sericulture.

SILKWORMS AND HOW TO REAR THEM, No. 3.

OTHER VARIETIES OF SILKWORMS.

THE TUSSEK.

The Tusser (*Antherea mylitta*) is a bi-voltine silkworm—that is to say, it goes through all its metamorphoses twice in the year. These worms are also semi-domesticated, or, in other words, the eggs are hatched indoors, the worms being allowed to feed on the trees by themselves, instead of on leaves plucked for them. In India, the first generation of moths emerge from their cocoons about the beginning of the rainy season (June), from cocoons which have lain dormant since the previous autumn, and lay their eggs; the caterpillars from these eggs complete their cocoons, and the moths emerge about August. The offspring of these moths produce the second crop of cocoons by the end of the rainy season (September), and these cocoons remain dormant throughout the winter, a period of over seven months, and produce moths in the following June, and so the cycle goes on. The worms hatch out about the ninth day. They live and feed from about thirty to forty days, passing through five moults, or changing of the skin, at intervals of from five to eight days, then spin their cocoons, and finally, after twenty-one days from the commencement of spinning the cocoon, the moth cuts out. The caterpillars, at the end of their larvæ existence, are usually about 7 in. in length. The cocoons are very compact in structure, containing a very large amount of a coarse, buff-coloured silk, and of immense size, reaching as much as 2½ in. in length by about 1¼ in. in diameter.

The Tusser worm feeds on a variety of plants, some of which are plentiful in Queensland. The two principal ones are, *Shorea robusta* and *Terminalia tomentosa*; the latter only is found in Queensland. Of the Terminalias or allied plants, we have several, especially in the north of the State, all of which are suitable for food. Besides the above, the worm feeds on the *Ziziphus jujuba* (to be found in most gardens) and *Eugenia (syzygium) jambolanum*; *Tecoma grandis*, or allied plants, which are common in Queensland, and known as the Queensland beech and *Lignum vitæ*; *Bombax heptaphyllum*, which is a native; *Cassia lanceolata*, and, indeed, all the Cassias which are abundant everywhere here; *Lagerstræmia indica*, a bush found in most gardens; *Carissa corandus*. Of the latter a common native species is found here—viz., *Carissa ovata*; *Ficus Benjamin*, the Weeping Fig, common in the State; Red Cedar; and, lastly, the common castor-oil plant.

When the Tusser worms are allowed to feed on the trees out of doors, constant watch must be kept to keep off birds and insects. If the cocoons which are attached to the branches are required for reeling, they must, of course, be collected, but, if for breeding, they are left on the trees till the moths cut out and the females are fertilised, when they are put into boxes to lay their eggs.

It is possible to rear these worms entirely indoors, if they are copiously watered once a day with a watering can, to imitate the heavy monsoonal rains.

The value of the Tusser cocoons lies in the fact that the pierced cocoons from which the moth has cut out are in great demand for spinning purposes.

Plate XXX. is a very good illustration of the Tusser male and female moths, cocoon, and worm.

THE MUGA.

The Muga (*Antherea assama*), like the Tusser, is a semi-domesticated silkworm, but very much more so, as the eggs are hatched indoors, and the cocoons spun indoors also, the worms only being allowed to feed in the open,



TUSSER MALE AND FEMALE MOTHS, COCOON, AND WORM.

Plate XXXI.



MUGA MALE AND FEMALE MOTHS.
COCOON AND WORM.

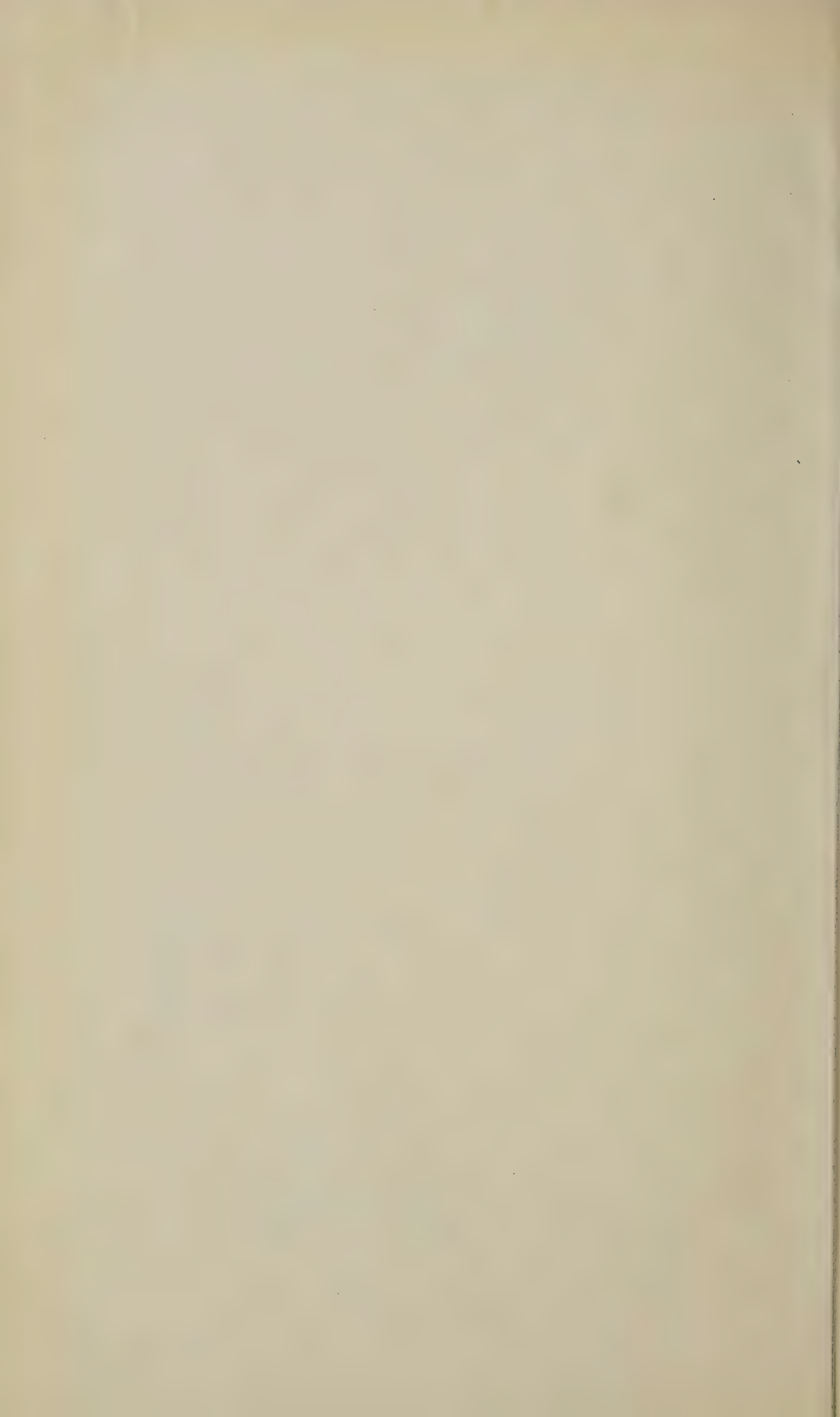
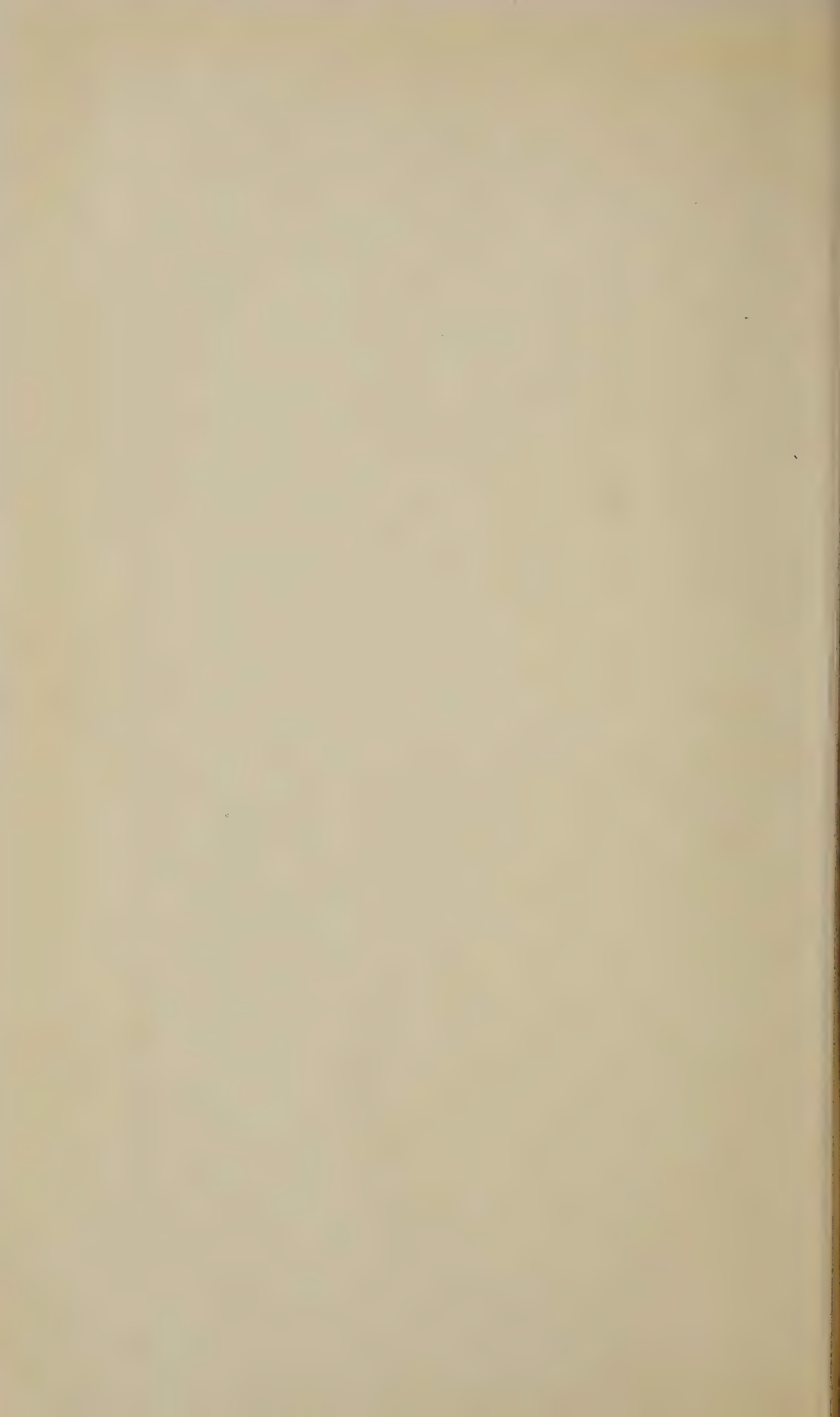


Plate XXXII.



FRI MALE AND FEMALE MOTHS.
COCOON AND WORM.



and brought indoors when about to commence spinning. They are then placed on bundles of twigs prepared for the purpose. It is believed that the worm can be reared entirely indoors. The Muga worm moults four times, and takes from 30 to 40 days, according to temperature, to reach the spinning period. The chrysalis stage lasts from 15 to 30 days, a complete generation occupying from 2 to 3 months, according as the weather is warm or cold. The Muga is a multivoltine worm, usually going through five generations during the year. Each female moth produces about 250 eggs. The following description of the Muga silkworm, by Mr. Hugon, will be of interest:—

“On being hatched, the worm is about $\frac{1}{4}$ -in. long; it appears composed of alternate black and yellow rings. The colour alters gradually as it progresses, the males change to sky-blue, then red with a bright gold-coloured ring round each. The full-grown worm measures, when extended, about 5 in. in length, and is about as thick as the fore-finger. Its colour is green. The cocoon is nearly 3 in. in length, by about 1 in. in diameter, of a golden-yellow colour. The silk is much more valuable than that of the Tusser, and there is a considerable demand for it in Europe.”

The Muga silkworm's favourite diet and chief food consist of the leaves of *Machilus odoratissima*, which is not found in Queensland, although there are several allied plants known as Laurinæ which would doubtless do as well. *Tetranthera monopetala* is one of these; another is *Sarcostemma brevistigma*, found all over Queensland, growing amongst the mangroves or near the beach; the common name of this is “The Caustic Vine.” *Ziziphus jujuba*, *Eugenia jambolanum*, and the castor-oil plant are also used.

The Muga cocoon is reeled, and can be also spun. The worms are raised in a similar manner as that described under “Tusser.”

Plate XXXI. illustrates the Muga male and female moths, cocoon, and worm.

THE ERI.

The Eri (*Attacus ricini*) is a multivoltine silkworm, reared entirely indoors in a similar manner to the ordinary mulberry worm.

Although as many as eight generations can be gone through in a year, not more than five are usually reared. The female moth lays about 200 eggs, which, in favourable weather, hatch out in about 10 days from the date of being laid, and a month from hatching sees the worm full-grown—during this period, passing through four moults—when it commences spinning its cocoon. The moth emerges in from about 2 weeks to 1 month, according to temperature.

The worm on hatching out is about $\frac{1}{4}$ -in. in length, and appears nearly black. As the worm grows, the colour changes with each moult, ending in a dirty white or dark green. The full-grown worm is $3\frac{1}{2}$ in. long. The cocoon is $1\frac{1}{5}$ in. long by $\frac{3}{4}$ -in. in diameter, of a white colour, although sometimes worms of the same brood, fed on the same food, will turn out brownish-red cocoons. The cocoon is somewhat loose in texture, but the silk is very strong.

The principal food of the Eri is the common castor-oil plant. It also feeds on the leaves of the Umbrella Tree of North Queensland, on the Physic Nut plant, and the *Ziziphus jujuba*.

A well-developed castor-oil plant will, after a season's growth, yield 14 lb. of leaves, so that an acre containing 2,732 plants will supply 38,300 lb. of leaves, sufficient to feed 600,000 silkworms in a season.

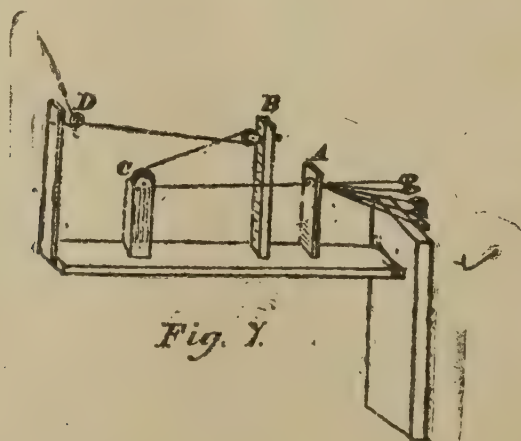
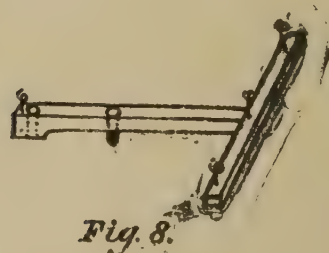
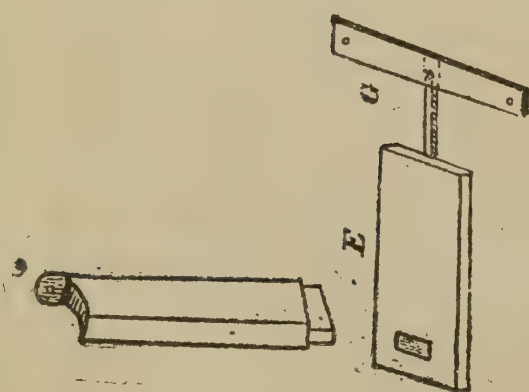
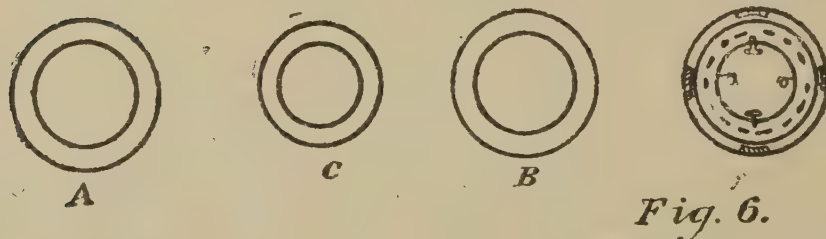
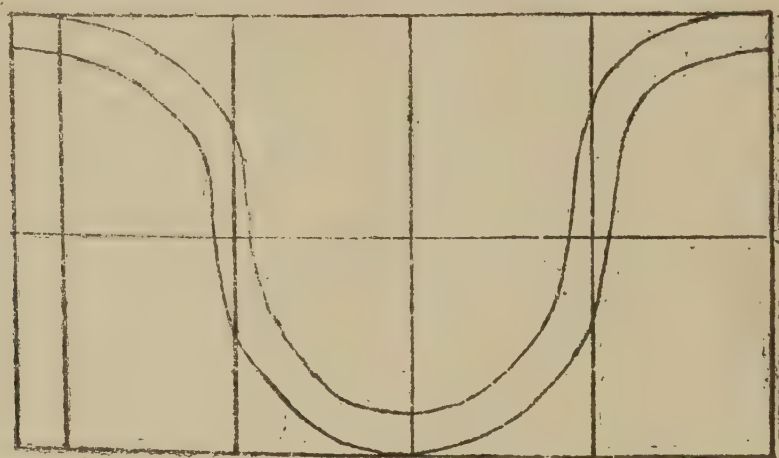
The value of Eri cocoons has risen considerably, and the demand in England is greater than the supply. The cocoon is worth 3s. per lb. dried, and, what is of great importance, no exception is taken to pierced cocoons—indeed, these latter are preferred, as there is no need to choke the chrysalis as in the case of the mulberry silkworm.

Plate XXXII. is a good illustration of the Eri male and female moths, cocoon, and worm.

STATISTICS.

As stated, one acre of castor-oil plants will support 600,000 Eri silk-worms during the year—that is, six broods of 100,000 each. Allowing for deaths, &c., these will produce 450,000 cocoons. One thousand six hundred Eri cocoons go to the lb.; therefore, 1 acre of land will produce 300 lb., which, at 3s. per lb., amounts to £45. Roughly speaking, to put 1 acre under castor-oil, and to rear the worms, should not cost more than £15, leaving a net profit of £30 per acre.

The accompanying diagrams illustrate the method of making the “tavelette.” It was accidentally omitted from our last article dealing with the reeling of silk:—



Tropical Industries.

CULTIVATION OF SISAL HEMP IN GERMAN EAST AFRICA.

(From the Bulletin of Miscellaneous Information, Royal Botanic Gardens, Kew.)

ENCOURAGEMENT TO QUEENSLAND PLANTERS.

The following article published by the "Kew Bulletin" should give great encouragement to sisal-growers in this State. It will be seen that cutting can only be carried on in East Africa for two or three years before the plant puts forth its "pole," so that, in order to maintain a good yield from 1,000,000 plants, 500,000 new plants must be put in between the old ones. Here Queensland has, from the experience gained by planters who have already machinery installed, a great advantage, as plants have not been known to pole here before the expiration of from 5 to 7 years, and, had the leaves been cut at maturity, probably 2 or 3 more years would have been added to the lives of the plants. In 6 years, the exports of fibre from one plantation—Kikogwe—rose from 7½ tons, worth £155 (£22 per ton), to 986 tons, worth £32,000 (£32 9s. per ton).

The following article on the cultivation of sisal hemp in German East Africa, which is an abstract from Dr. Stuhlmann's paper in "Der Pflanzer," Nos. 15 and 16, September, 1907, pp. 229-243, appeared in the "East African Standard" for 16th May, 1908:—

In 1893 the German East Africa Company in East Usambara ordered 1,000 sisal plants from Florida, but only 62 survived the journey. These were carefully tended in the plantation at Kikogwe, and new plants were propagated from them, so that in 1898 the number had increased to 63,000. In 1899 machinery was introduced for extracting the fibre. By the beginning of January, 1900, there were no less than 150,000 plants established, of which 4,000 were more than 3 years old and were ready for cutting. After it had been ascertained, by means of small samples sent for valuation, that the fibre was of good quality, the first consignment was made in 1900. The following are the amounts and values of the exports of sisal hemp from Kikogwe during the years 1900 to 1906:—

Year.	Amount.	Value.	Year.	Amount.	Value.
	Tons.	£		Tons.	£
1900	7½	155	1904	624	18,300
1901	45	1,300	1905	887	27,000
1902	177	5,445	1906	986	32,000
1903	347	9,860			

In 1894, out of a total of 1,800,000 plants, as many as 1,300,000 were ripe for cutting, and from these were obtained 624 tons of fibre; hence the yield per plant was about 17 oz. The same number of plants were cut in 1905, and yielded 887 tons, or about 25 oz. per plant. In 1906 there were 1,600,000 plants fit to be cut, and these produced 986 tons of fibre, or about 22 oz. per plant. From these figures it appears probable that each plant, after reaching the age at which leaves can be cut from it, will give an annual yield of 17 to 23 oz. of fibre, and that in a carefully-cultivated plantation about two-thirds of the total number of plants will be ready for cutting if replanting is carried out where necessary. From 1,000,000 plants, of which

666,000 can be cut annually, a crop of 333 to 433 tons of fibre may be anticipated. In order, however, that this yield may be maintained, it is necessary that 500,000 new plants should be inserted between the old ones, as cutting can only be carried on for 2 or 3 years in German East Africa before the plant puts forth its inflorescence, or "pole." It is calculated that if 800 plants are planted per acre an annual crop of 900 to 1,200 lb. per acre should be obtained. The results obtained at Kikogwe lend support to this estimate.

The following table gives interesting particulars as to the approximate number of Agave plants in the different districts of German East Africa at the beginning of 1907, and the proportion which were ready for cutting:—

District.	No. of Plantations.	No. of Plants.	No. of Plants ready for Cutting.	Total Area Planted.	Area occupied by Plants ready for Cutting.
				Acres.	Acres.
Tanga	13	10,305,600	2,168,000	14,250	3,190
Wilhemstal	3	810,160		560	
Pangani	2	3,330,000	2,200,000	5,000	3,500
Lindi	5	1,127,000	110,000	1,330	137
Total	23	15,572,760	4,478,000	21,140	6,827

In the Tanga district the low proportion of the plants which were ready for cutting is explained by the fact that at the time of making the estimate many of the recent plantings had not reached maturity.

The four districts mentioned above require a total number of daily workers of 8,500, or, allowing for absence from illness or other cause, a staff of at least 11,300 people. The workers are paid on the average 40 hellers per day.

The machine employed for sisal hemp extraction in the larger undertakings in German East Africa is one which is used to some extent in Yucatan, Mexico, and is known as the "Molla" machine.

It costs about £650, is capable of treating from 85,000 to 120,000 leaves in ten hours, and needs about 48-h.p. to drive it. The bundles of leaves as brought in from the plantation are placed by one or two workers on a travelling lattice, which carries them to a table in front of the machine. Four men are then required to open the bundles and lay the leaves on the conveyer, which introduces them to two raspadors arranged at right angles to one another, where they are cleaned, one-half of the leaf being stripped at a time. The fibre on leaving the machine slides down on a wooden frame, and is then subjected to washing, women being employed for this work. In order to keep the machines sufficiently employed a plantation of at least 600,000 plants is requisite, which, allowing a space of 40 in. by 100 in. (about 3½ ft. by 8½ ft.) for each plant, will cover an area of about 310 acres. Disadvantages possessed by this machine are the difficulty of replacing damaged parts, and the lack of durability of the bronze coating with which certain portions of the machine are provided.

The following are the approximate quantities and value of the sisal hemp exported from German East Africa since 1902:—

Year.	Quantity.	Value.	Year.	Quantity.	Value.	Per Ton.
		£			£	£ s.
1903	422	16,000	1905	1,140	43,900	38 10
1904	765	28,300	1906	1,836	66,900	36 8

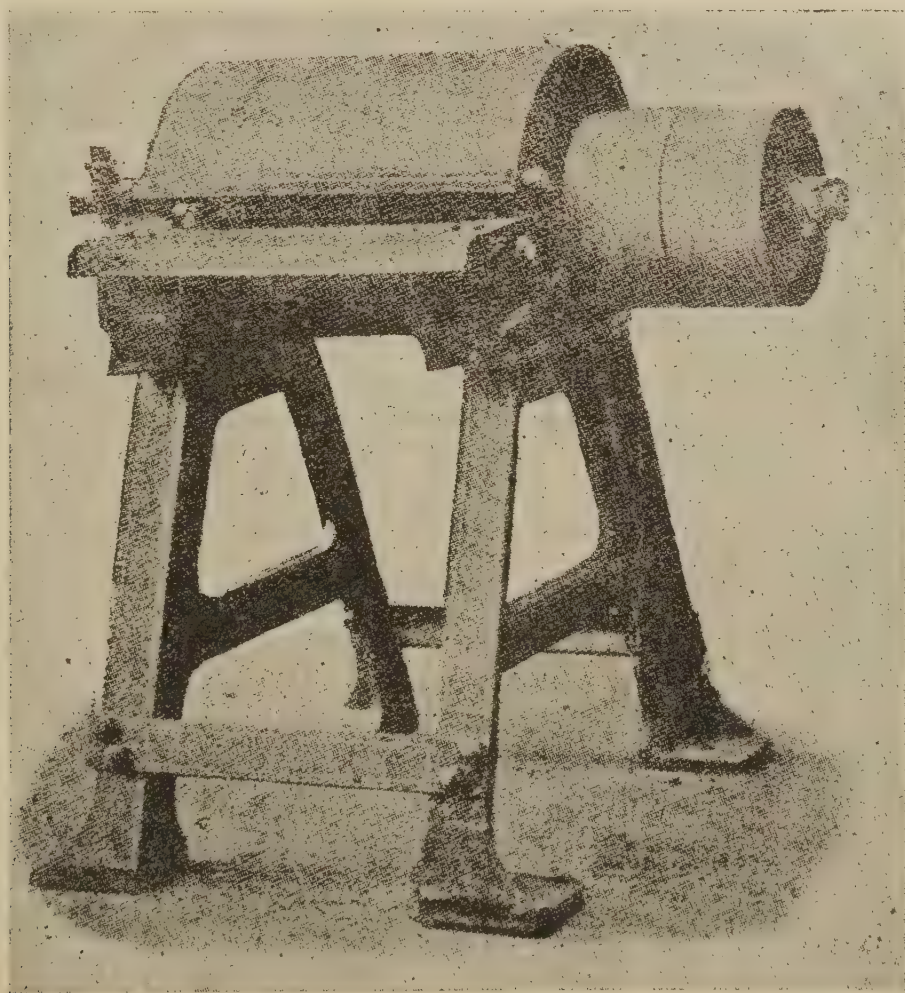
During the first half of 1907, the exports from Tanga and Pangani amounted to about 1,321 tons, of a value of £50,600, or £38 6s. per ton.

These figures must be taken as absolutely correct, seeing that they are published by the authority of the Director of the Botanic Gardens, Kew, and must have been fully verified before publication.

SISAL FIBRE DECORTICATOR.

Amongst the numerous machines devised for the cheap extraction of aloe and other fibres, there are few which will enable the white grower in Queensland to compete with the cheap black labour in other countries. What is wanted by the grower of from 50 to 100 acres of sisal or sansivieria is a machine costing from £50 to £75 landed here, which will, with a minimum of labour and engine power, turn out from 750 to 1,000 lb. of clean fibre in a day of 8 hours. No such machine has yet been placed on the market. Certainly the decorticator designated as A1 by Mr. E. Lehmann, a Manchester engineer, comes closest to the requirements of the small planter. This machine costs £65 in England, and is said to be equal to turning out 750 lb. of clean fibre per day of 12 hours. But the Queensland working man's day comprises only 8 hours, hence the day's work, if all runs smoothly, only results in a turn-out of about 5 cwt. per day.

We now find another machine adapted to both sisal and sansivieria leaves, in the market in Rhodesia. The name of the maker is not given, but it is supplied by The Eastern Landing, Clearing, and Forwarding Co., Ltd., 28 Strand road, Calcutta, India. The price is, including packing and delivery f.o.b. export steamer, £28. The weight of the machine when packed is from 12 to 15 cwt., which can be split up into 3 handy packages, totalling 40 cub. ft., or 1 ton measurement.



The following particulars are given of this decorticator:—

Length at base, 3 ft. 2 in.; breadth, 2 ft. 8 in.; height, 3 ft. 10 in. The feet have holes bored, making it suitable for bolting on to sleepers, thus rendering the machine easily portable, and doing away with the necessity of expensive building foundations.

The total gross weight of machine fitted complete is 12 cwt.

The machine is capable of receiving two leaves at a time, and, with two men feeding, will deal with 8,600 lb. of leaves (*Agave rigida sisalana*) per diem, thus giving an out-turn of 300 lb. dry fibre.

There would also be a quantity of fibre recoverable from the waste, which has a considerable market value. It is advisable, in order to obtain the best results, to put the leaves through the decorticator as soon as possible after they are cut, and before they become dry and weedy, as in this state the decortication is somewhat difficult.

The machine requires $\frac{3}{4}$ nominal horse power, and should be driven at 700 to 800 revolutions per minute.

The machine is fitted, if desired, with a sprayer which ensures a continuous run of water on the leaves during the process of decortication.

SISAL (MAGUEY) IN HAWAII.

The following instructive account of the cultivation of the sisal plant, and the production of the fibre in Hawaii, forms the subject of an article in the "Philippine Agricultural Review," by the editor of that journal. It bears out much of what we have stated concerning the cultivation of the plant. Singularly enough, when the fall in prices for the fibre took place in Yucatan in 1907, the price obtained in Victoria for Queensland fibre was £32 per ton. The article in question is as follows:—

There is much land suitable for the cultivation of sisal on all of the islands of the group. Sisal is not in the stricter sense a cultivated plant, practically no cultivation being given after the plantation has been established, other than to clear out glue, lantana, and other weedy undergrowth. Sisal may be cultivated on any land not too thickly grassed, from sea level to an elevation of 2,000 ft. The controlling factor is rainfall and not elevation above sea level. While this crop has been cultivated in large areas in extremely barren and rainless country, such a location should not be chosen if cheap lands in a moderately wet district are available. Better results through more rapid growth and maturity are obtainable in locations where the rainfall ranges from 20 to 50 in. per annum than where it amounts to less than 20 in.

Sisal is propagated from suckers or offshoots which appear at the base of the mature plants; and from pole bulbs, which follow the flowers instead of the seeds. The sisal plant almost never produces true seed pods, and even when these are produced the seed is seldom fertile. If suckers are used they may be transplanted at once to the field, but pole bulbs must be planted a year in fertile land to force their growth. While pole bulbs are sometimes set out in regular nursery rows, far enough apart to cultivate between them, a better style of plant for transplanting is secured by setting the bulbs in a compact mass, the individual bulbs not more than 2 to 4 in. apart. This makes a close, compact plant, easier to transport and handle than are the suckers or pole plants which have been set in nursery rows at wider distances. The object of nursery planting is to force growth in the early stages, shorten the period between planting and maturity, and add greater uniformity to the field.

Before planting it is best to clear the land of brush and weeds. Roadways should be laid out on such a contour that portable tracks may later be built through the plantation to facilitate the harvesting of the crop.

The plants are set in the field in regular rows from 7 to 9 ft. apart and from 4 to 8 ft. in the row, at the rate of from 800 to 1,100 plants per acre. It is a disputed question as to the amount of cultivation that can be profitably given, as well as the amount of preparation necessary before planting. Practice varies from picking up a circle 3 ft. or more in diameter around the young plant, to no cultivation other than a hole made with a single blow of a mattock, loosening just enough dirt to pack the plant in position until it sends out roots.

Harvesting begins at the end of the third year after the nursery plants or suckers have been set in the field. The leaves are considered ripe for harvest when they have fallen from their rigid, erect position to a looser, horizontal one. From ten to twenty of the lower leaves are cut from each plant. In 6 months another crop is cut, and so on until all the leaves have been taken. The leaves are bundled and hauled to the mill on carts or cars. The location of the mill should be decided upon before any planting is undertaken, being located either at the lowest point of the land or convenient to shipping facilities. The fibre is extracted from the leaves by high-power modern machinery especially devised for the purpose. Two systems of milling are in use. One type of machinery requires a supply of water which is trickled over the leaves while the fibre is being extracted. The other type requires no additional water supply other than the abundant juices of the leaf itself. As soon as the fibre is extracted it is hung on lines out of doors where the sunshine can dry and bleach it. When well dried and bleached it is made up into firm bales of 400 to 500 lb., and is ready for market.

In Hawaii the average life of the sisal plant is about 9 years.

At least two crops can be harvested every year beginning with the third. As soon as the plant has thrown up its flowering pole it dies; the plant is then uprooted, and another nursery plant set in its place.

Hawaiian-grown sisal is pronounced by fibre experts to be of the best quality. It is superior to that produced in Yucatan, its only direct competitor being a limited supply which comes from German East Africa. The yield of fibre varies according to the number of plants set to the acre, and their size and vigour, but may be taken as averaging about 500 lb. to the acre per annum, or about 3,000 lb. per acre for the full life period of the crop. The fibre composes about 4 per cent. of the weight of the leaf. In milling, the larger portion of the short fibres at the base of the leaf go into the waste. The average recovery of fibre in milling does not exceed $2\frac{1}{2}$ per cent. of the total weight of the leaf, and sometimes, through carelessness or badly-adjusted machinery, not more than one-half of this amount.

The profitable disposition of the waste is somewhat of a problem. In Yucatan the waste is fed to cattle, a portion of the wages of the plantation labourers being paid in fresh meat. Every plantation in Yucatan runs a large herd of cattle. The milling takes place in the daytime, and the cattle are turned in to the mill yard at night, cleaning up thoroughly the pulp and waste fibre produced by the machines during the day. Cattle eat the sisal pulp readily, and thrive upon it. In Hawaii the only use thus far made of sisal waste has been to dry it, clean out the short fibres, and curl them for use in the manufacture of mattresses. The sisal waste, or at least that part of it consisting of the short and broken fibres, is worth from 1 to $1\frac{1}{2}$ cents per lb. as paper stock. The size of the plantation and the amount of waste will to some extent govern the methods of its disposal.

Fibre-extracting machinery is not expensive. The total cost of buildings and machinery for a sisal plantation of 500 acres should not exceed 10,000 dollars (£2,000). The outlook for this crop is a very good one. The total world's crop of sisal is less than 400,000 tons, and the demand for sisal has been growing more rapidly than for Manila or other competing fibres. The prices f.o.b. Honolulu during the last 5 years have ranged from 6 to 8 cents (3d. to 4d.) per lb., although during the panic in the latter part of 1907 the

price fell to $4\frac{1}{4}$ cents ($2\frac{1}{8}$ d.), bringing financial ruin to practically the whole Mexican Province of Yucatan. At this writing (June, 1908) prices have recovered to about $6\frac{1}{2}$ cents ($3\frac{1}{4}$ d.), equal to £30 6s. 8d. per ton, and the trend seems to be upward. Those who have studied the fibre market of the world believe that both demand and prices are bound to increase.

The sisal crop is an attractive one for individuals or corporations owning large areas of cheap lands suitable only for grazing. There is practically no cost of cultivation other than the most meagre preparation of the land, the purchase of plants, setting them in the field, the harvesting of the leaf, and the shipping of the fibre. The industry is one which does not require the continuous employment of large numbers of labourers. It may be undertaken at a comparatively small capitalisation per acre, and may be carried on without the large monthly expenditures which must be incurred in the cultivation of more remunerative crops on better land. There is much land suitable for the cultivation of sisal on every one of the islands of the Hawaiian group.

MANUFACTURE OF RAMIE.

In continuation of an article on the Ramie Industry, "The Pastoralists' Review" says:—

Ramie can be cultivated in all soils and climates such as before named, and it thrives best in the shade. It is a hardy perennial—that is, its roots do not perish annually like those of flax, but, on the contrary, a single sowing of the plant with slight care will last for many years. The plant is propagated by means of seed roots and suckers, and it grows to a height of about 6 ft., yielding from four to six annual cuttings of fibre-yielding stems. It has been known to grow 8 ft. in height. The stems of the plant turn brown in colour when the fibre has matured; they must then be cut off about 2 in. above the ground. The cost of ramie cultivation has been estimated by various authorities to be about £4 per acre, and, under the best systems of growing, a yield of 1 ton of dry fibre per acre per annum may be obtained. The first year's crop of stems will be of little value for textile manufacturing purposes, but the second year's will be of good quality and readily saleable. It improves annually thereafter in yield and quality. Its fibre yield per acre is in excess of that of flax, and, as a fibre, is rather lighter; a further marked advantage in connection with its use for sailcloth manufacture is that vessels with ramie canvas can carry a greater amount of canvas without danger than when flax and cotton are used in their weaving. This circumstance caused Sir Thomas Lipton, in racing his yacht "The Defender" for the American Cup some few years ago, to have the sails made from ramie, and it is also advantageous in tent canvas and fishing line and net making.

The fibre yield of the plant and its quality is improved by suitable manuring. Liquid manures are the best to use, farm manure being used only as a winter covering. From a comparatively small number of plants a fairly extensive plantation can quickly be created. The roots should be set in furrows after the land has been well manured; the ground can then be pressed down, and, if the rainfall is good, they will make a rapid growth. The stems come to maturity in about 6 months, after that one line of plants in each two may be taken away, their roots divided, and these reset. The leaves when stripped from the stems are a good fertiliser for the ground. For the purpose of stripping the bark from the stems and cleaning the fibre a machine has recently been invented by M. Faure, a French engineer, of Limoges, France. This machine may be said to be at once both effective and economical. It represents the outcome of many years' close study of the question of the fibre's successful decortication, and it was some little time ago tested on green ramie stems grown on land owned by Mr. Faure at Limoges, in the presence of several gentlemen interested in ramie growing and spinning,

who expressed themselves well satisfied with the manner in which it did its work and its product. Worked by two men, it is capable of cleaning 32 cwt. of green stems in a day of 10 hours; the article produced is a clean uncrushed and unbroken fibre equal to the hand-cleaned ramie or China grass of China, the entire removal of the bark and all woody portions of the stem is effected, together with the major portion of the gums and resins, at a cost of £3 12s. per ton for dry fibre produced. The cost of each machine is £40. It is strongly built, so as to stand the wear and tear of plantation use. The cleaning capacity of the machine, it was urged, is not large, but M. Faure, however, is devoting his efforts to improve upon it in this respect, which he is confident he will be able to do. If the decortication of the stems is carried out daily, however, as they mature, instead of this being left to be done in the course of a couple of weeks' time, at the end of four seasonal cuttings one of these machines will be found capable of cleaning the fibre production of many acres of land, and when a number of these are in use an endless travelling apron passing from one machine to the other removes the refuse and keeps the neighbourhood of the machines free from this.

Another method of preparing the fibre for the market in the form of the bark strips, or, as they are called, "ramie ribbons," is to place the stems in wooden boxes about 6 ft. long by 2 ft. wide and 2 ft. deep, and closing the lid inject steam into the boxes by means of a steam producer. When they are opened and the fibre is removed the bark will be found to readily separate from the stem. These boxes can be moved from place to place on ramie plantations followed by small portable boilers. After machine decortication or this steaming process, the fibre is extracted or degummed, and then in the form of a fine white silky material, which is called "filasse," it is ready to be taken into the mill for the purposes of preparing, combing, spinning, and weaving. It is for this decorticated fibre equal to China grass and for ramie ribbons that a demand exists on the part of ramie spinners for use in place of the more expensive China grass imported from China. The price obtainable for "Faure decorticated fibre" is about £23 per ton, or slightly over; for well-cultivated ramie ribbons about £10 per ton, or slightly over, may be obtained at port of shipment, both of which prices will show a good profit to the planter. Great care must, however, be exercised after stripping the ribbons from the stems to dry them thoroughly, and they must not be baled in a damp or wet condition; if this is done fermentation will set in, and damage the strength of the fibre on its voyage to manufacturing centres; the ribbons should be spread on wire nettings and exposed in the sun until thoroughly dry, being removed indoors at night to avoid the damp and dews. Bales for export should be from 5 to 10 cwt.

The fibrous bark can also be removed from the stems by making a slit in the centre of the stem with a small knife, inserting the fingers and stripping the fibre from the stems. This method of doing the work is well understood by the Chinese, as well as is the rapid hand-cleaning of the fibre. It is the method for small native or other agriculturists who might grow the fibre as a garden or small field crop. Raw supplies are imported into Europe through the medium of London, Antwerp, and Hamburg produce broking firms, and into the United States through New York.

Ramie fibre when well extracted or degummed is in the "filasse" condition equal in regard to quality and wear to Belgian flax costing about £60 per ton. Each ton of ramie ribbons degummed yields half a ton of this white fibre or "filasse," and each ton of China grass and machine-decorticated fibre 70 per cent. on net weight treated. On all plantations for ramie growing pathways require to be left, as in the case of tobacco, cotton, indigo, ginger, and other estates, to permit of labourers passing about the fields and cutting the stems, and roadways should be provided on large growing plantations for the passage of vehicles; a central road when made can be used to take the crop as gathered to the buildings where it has to be decorticated and stored. Each native should carry a hand-basket in which to deposit the stems when

cut, and when his basket is full he can place it on the cart to take it to the stores, or on a light tramway which could be run up and down the estate at regular intervals.

Rice and jute lands are not suitable for ramie growing, as in permanent dampness the roots of the plants rot away, nor can it be successfully cultivated for fibre purposes in strong compact soils, even if they are easily accessible to irrigation. The plant has been known to stand well the severest winters and prolonged droughts, but in the case of the latter its external growth will languish. The cheapest method of producing "filasse" is to carry out not only the process of decortication, but that of degumming also, on the lands where the fibre is grown by means of native labour, which is cheaper than that which has to be employed when this is done in manufacturing centres, and a further considerable saving is effected in this way by shipment to these only of the extracted fibre in a condition ready to be passed through the processes of preparing, combing, and spinning in the mills, instead of in the undegummed state, when freight has to be paid on about 50 per cent. of bark, gum, and woody matter which has no value as a commercial product, and in this way "filasse" can be produced at about £20 per ton. Ramie is a very much superior textile to either the higher grades of cotton or jute, and, although it can be obtained in this way at a price which is very low, it commands a better figure on the market than these textiles.

Great difficulties were experienced in the early efforts to work the fibre, on account of the fact that it is not so elastic as cotton or flax, and to cover this defect the fibre is submitted to a special treatment in its degumming in all the best processes in use to-day, which imparts ductility to it, and causes it to spin with ease and free from undue breakages, tangles, or knots, and its peculiarities are governed when it is being woven into the finer descriptions of fabrics into which it is now being manufactured, such as dress materials, art linens, and tapestries, by special motions and modifications in the looms employed. For the general run of cloths the yarns can be woven on any loom. In combing preparatory to spinning, its yield of long fibre, which is the most valuable for textile manufacturing purposes, compares favourably with that obtained from flax; from 70 to 81 per cent. of long and medium length fibre is obtained, the short fibre or waste thus averaging from 30 per cent. down to 19 per cent. This is manufactured into cheap blankets and shoddy goods, which have a profitable sale. In dyeing and printing the fibre, the very best results in regard to uniformity and fastness of colours are to be had as cheaply as in the dyeing and printing of other textiles, either when the yarns are woven into pure ramie cloths or mixed with cotton, flax, worsted, or silk warp yarns; special dyes are, however, necessary in dyeing the fibre when it is woven in combination with silk, the one being a vegetable and the other an animal product.

The fibres of ramie do not show as great a disposition to adhere together as those of cotton, but rather a tendency each to go its own way, and special means, which it has taken many years to devise, have had to be made use of in spinning the fibre successfully to deal with this peculiarity as well as the difficulty of passing filaments of such a great diversity of lengths as from 3 to 14 and even 16 in. simultaneously through the processes of drawing prior to spinning. The overcoming of these obstacles within recent years, however, has led to an increase in the spinning and weaving of ramie textiles in Europe and the United States, and when well degummed, as in the chief extraction factories, the material is found free from brittleness, harshness, and hairiness, producing round, smooth, even yarn and well-woven fabrics. The spinning of ramie yarns is carried on in mills in Berlin and in Lyons, and other districts in France, Rochdale in Lancashire, Dundee in Scotland, and other places by firms who purchase the degummed "filasse" from extraction mills, and who make its spinning their exclusive trade. In many other districts in England, on the Continent, and in America it is spun more or less by flax, worsted, and silk spinners, who purchase the material either in the "filasse" state from

extractors or in the form of a skein, or, as it is called, a "sliver." There have only been two liquidations of ramie mills within the last few years, caused mainly by faulty processes.

There are two varieties of the ramie plant, known botanically as *Boehmeria nivea* and *Boehmeria tenacissima*: the former is the temperate zone variety, and the latter the equatorial plant. *Boehmeria nivea* is distinguishable from *Boehmeria tenacissima* by reason of the backs of its leaves being silvery white in colour, those of the latter species being green. The fibre of the variety of the *Boehmeria nivea* is rather finer than that of the *Boehmeria tenacissima*, and is capable of being spun into higher counts of yarn, but it is not quite as strong as the fibre of the *Boehmeria tenacissima*. The highest counts or finer classes of ramie yarns are spun in London, England, some as high as 180's silk counts, the French and German mills spinning up to about No. 80's in metric counts. The cloths are silkier, wear longer, and are cheaper than such artificial silks as Chardonnets, Viscose, Bronnerts, and other wood-pulp silks so extensively manufactured and exported from France and other Continental countries, also the various classes of mercerised goods.

The degumming of the fibre is carried out in extracting factories in high-pressure bleaching kiers; when this is done on plantations, special digesters are used. The machinery for preparing and combing ramie cheaply and well is made by several English and Continental machinists, and can be purchased on the market in the ordinary way. The plant necessary for its degumming or extracting, while not costly, is of a special character, and its manufacture is carried on by a few firms who make a specialty of the same.

The perfecting of the methods of ramie manufacture from its decortication to the weaving of the yarns which has taken place within recent times, the erection of new extraction and spinning mills, and the declaration of large dividends such as those paid by the principal English, German, French, and Swiss mills, give promise of its growth into a leading textile industry in the near future in a somewhat similar manner to the rise of the trade in jute, out of which since its beginning more than 20 millions sterling has been earned in profits; the source of raw supply for this great trade is India, and jute cultivation is a widespread and profitable industry for the Indian planter. In like manner the experimental cultivation of ramie in suitable soil and climates is well worthy of the attention of tobacco, sugar, indigo, ginger, and other planters. Lands on which the vine grows are well suited for ramie growing; on tobacco, sugar, indigo, and certain cotton soils it will thrive luxuriantly; the great height to which its stems shoot fit it well for serving the purposes of hedges on plantations of this kind, and the crop if given a medium amount of attention in cultivating can then be cut down and find a remunerative market. In regard to the decorticated fibre produced by the "Faure" machine, Messrs. Larmuth and Sons, engineers, of Salford, England, will be pleased to forward samples of this product to any people interested in the matter. This decorticator does not produce bark ribbons or ramie ribbons, but a clean fibre, ranking equally on the market to the costly hand-cleaned China grass of China.

On the occasion of her recent tour in India, it may be mentioned, Her Royal Highness the Princess of Wales carried with her and wore a large assortment of costumes specially manufactured for her by the London Ramie Mills, with which she expressed herself more than satisfied, and which excited general admiration. A large use for this fibre will arise when raw supplies are cheaper.

The possibilities of the fibre's profitable spinning and weaving in non-flax-growing countries, and where linen manufacture is limited, are great, as it can be produced cheaper than the latter, which accounts for the marked success which has attended its manufacture in France and Germany since the establishment of the industry in these countries little more than 10 years ago.

PACKING VANILLAS FOR SHIPMENT.

Since the Instructor in Tropical Agriculture at Kamerunga, Cairns, introduced the vanilla vine to North Queensland, considerable attention has been paid to the cultivation of this valuable product. From what has been seen at various exhibitions of the cured vanilla bean from Cairns, it is quite evident that the cultivation of the plant in suitable parts of tropical Queensland will be attended with success. It appears, however, that even in countries such as those below mentioned the science or art of properly packing the product to avoid mouldiness has not yet been properly understood. The "Ceylon Tropical Agriculturist" discusses this important matter as follows, and quotes prices for vanilla beans from "Tropical Life," as given below:—

At the May public sales held in London, prices realised for this article were rather easier than those paid at the April auctions. In proportion to the rather indifferent quality, due to unscientific curing and packing, prices realised, as shown below, were fairly good, and ranged from barely steady to about 6d. below the sales in April.

What might have been a nice useful lot of Tahitis, saleable at 2s. 6d. to 2s. 9d. per lb., were found on being opened to show signs of poor curing and a tendency to become mouldy. Shippers' attention, and not only those connected with Tahiti, has repeatedly been called to the mistaken idea of stuffing vanilla tins as full as possible, and then soldering on the cover so as to render the inside hopelessly air-tight. No vanillas should be packed absolutely air-tight, and least of all common and insufficiently dried Tahitis. The beans swell on the voyage, and also sweat copiously; if, therefore, the tins are rigidly air-proof, the condensed vapour clings to the tin, and hangs over the beans. On opening, one finds the inside not only damp and rusty, but corroded and rough with scales of rust, and the excess of moisture can be squeezed out of the bundles. The result is that almost immediately signs of mould appear, and in a week, when buyers arrive to inspect the shipment, the beans are all more or less badly moulded, and worth only 4d. per lb. or so, instead of 2s. 6d. This serious loss is entirely due to insufficient drying, packing in air-tight soldered tins, and also through squeezing into eighty large pitch-oil tins nearly 100 cwt. of beans, which should have been distributed between 100 or even 120 tins, so as to allow for aeration and expansion on the journey across.

The ideal method of packing is to use tins of about 10 lb. to 15 lb., or rather more, each provided with a well-fitted turned-over-edge lid that grips the sides. Such a tin is all but air-tight, though able to allow gases or excess of moisture to escape and so prevent any chance of the contents becoming damp or even mouldy. It is not even necessary to paper the lid on to or down to the sides of the tin, as that prevents such ventilation taking place. It is advisable, in order to ensure the lids remaining tight down on to the tins, either to solder the corners only or else to tie them with strong twine, but not to solder all round the tin. If the Tahiti shippers find it necessary to keep to their well-known large soldered pitch-oil tins they should perhaps make two small punctures at the top and bottom of the tins at the extreme corners, pack the contents less tightly and well dry their beans after curing; it would then be found that the outturn would be more satisfactory and far less liable to deterioration than with present methods.

Prices realised ruled as follows:—

Seychelles.—Fair quality, 2½ to 8 in., 5s. 9d. to 7s. 6d. per lb.

Bourbon.—Fair quality, 6½ to 7½ in., 8s. per lb.; fair quality, 6½ in., 7s. 9d. per lb.

Madagascar.—Fair quality, 6½ to 7 in., 9s. 6d. per lb.; 6 to 6½ in., 7s. 6d. to 9s. 3d. per lb.; 4 to 7½ in., 6s. 6d. to 8s. 6d. per lb.

Zanzibar.—Common cure, brown and split, 6s. to 7s. per lb.

Java.—Common brown, 6s. per lb.

Ceylon.—A single bin, dry brown, of poor flavour, 5 to 7 in., 2s. per lb.

THE COCOA-NUT.

The cocoa-nut palm is a native of the tropics, and is not known to occur at a distance of more than 28 deg. north or south of the equator. It is at its best farther to the south than Hawaii. While the tree has largely been considered a sea-shore plant, and while many authorities have considered that salt water was essential to its most perfect development, recent cultural experiments have demonstrated that a much more vigorous and productive growth may be obtained far inland.

The cocoa-nut tree demands above all things good drainage. It thrives neither in swamps nor on rocks. The roots are thick, fleshy fibres, there being no taproot. The roots seem to be specially adapted for the storage of considerable quantities of water, but wherever they reach the level of permanent standing water, or wherever stagnant waters rise above the level of roots already formed, these rot and the tree sends out new and shorter roots only as far as the perfectly drained and well aerated soil extends. The tree is a heavy feeder, requiring cultivation and fertilisation, giving best results where these can be augmented by irrigation or abundant rainfall.

Another factor is that the tree grows best in windy locations. Specimen trees in sheltered valleys, where the wind never strikes them, are more liable to be spindling and unhealthy. The requirements of the cocoa-nut may be summed up in having light and room in windy locations, where the soil is rich and well drained, and there is abundant artificial or natural irrigation.

In planting the cocoa-nut only the ripe nuts, carefully collected, from neither very young nor very old trees, should be taken. Nuts intended for planting should not be dropped or thrown from the tree, for if the shell is cracked within the husk germination will not take place. The husk contains enough moisture for germination, provided the seed bed is moist and half shaded. In drier locations the nuts should be planted on their sides and partially covered with loose, mellow earth, leaving about 2 in. of their surface exposed. The seed beds thus prepared should be kept moist, but not soaked. Germination takes place in from 2 to 6 months. As soon as the plumule pushes out through the husk on one side and roots are just appearing below, the seedling is ready to transplant to its permanent location.

Two methods of planting are in vogue. In India pits 3 to 6 ft. across and 2 to 3 ft. deep are dug 27 to 36 ft. apart. These pits are filled with sand, manure, ashes, compost, rotted leaves, and rich soil. The germinating seed is half buried in the centre of the pit, and no further cultivation is given except to clear the weeds, and no more fertilisation than to utilise the cocoa-nut grove for pasture lands.

The newer method, and one which has been proved to give better results, is to plough the land and work the whole surface into the best possible state of cultivation. Frequent tillage follows with the planting of leguminous intercrops and the addition of commercial fertilisers. The trees should never be planted closer than 30 ft., or at the rate of from 110 to 150 trees per acre. Close planting in rows, as seen in many native groves and in dooryards around Honolulu, and for that matter, all through the islands, is neither a satisfactory nor profitable method of cocoa-nut cultivation.

There is the widest variation in the number and size of cocoa-nuts borne by individual trees. Some trees may produce only a dozen nuts in the course of a year, others bear from 150 to 200, or more. Some trees begin to bear in their fifth or sixth year, others not for ten or fifteen years. The greatest profit in cocoa-nut cultivation will come by planting only nuts from trees known to have the most desirable qualities, both in early maturity and prolific yield. The trees continue to bear for 50 or 60 years or more, but during this time cultivation should be continued and the supplies of plant food taken from the soil returned in the form of organic or commercial fertilisers.

When the plantation begins to bear, the nuts are gathered as they ripen, the husk removed, either by hand or modern decorticating machines, of which

there are many styles and patterns designed for the dual purpose of husking the nut and saving all of the fibre from the husk. The nuts are then split in halves and placed on drying floors in the sun. In 24 hours the meat curls loose from the shell and may be taken or emptied out. The meat is then dried for 1 or 2 days in the sun, and finished off by artificial heat, or the meats are sliced by machinery and finished in steam-heated drying houses.

The Samoan cocoa-nut is considered the best variety for cultivation in Hawaii because it commences to bear at an earlier age and is more prolific than the Hawaiian tree. A cocoa-nut orchard in good bearing should yield from 10,000 to 15,000 nuts per acre per annum. Yields of nearly double these amounts have been obtained in other lands, but the Hawaiian average is considerably under this. The best practice would be not to produce copra for export, but to extract the cocoa-nut oil on the plantation where the nuts are grown. The flesh of the nuts contains on an average about 35 per cent. of oil. If this is extracted by modern commercial methods at least 30 per cent. of the oil is recoverable, and the cake, or waste, becomes a valuable by-product for feeding cattle or for returning to the land as fertiliser.—“*Philippine Agricultural Review*.”

CHILE CULTURE.

GREEN CHILE.

A large amount of the chile is eaten in the green stage. In fact, practically all the chile used during the summer months is green. Before the chile is ready for use it ought to be almost full grown. This stage can be recognised by the green pod having a noticeable bright or shiny lustre, and being firm enough to resist considerable pressure when pressed between the thumb and fingers. If pressed tightly the pod will emit a slight crackling sound. When the chile is picked too immature the shrinkage in weight is soon noticed, and the pods shrivel so much that the peeling of them becomes more tedious. Green chile for canning purposes should be mature, and the pods ought to be smooth and as large as possible. A typical pod for canning should be from 4 to 6 in. long, or longer, and about 1 in. or more in diameter at the stem end, gradually tapering down to a point. It should be smooth, straight, and fleshy. Aside from taking more time to peel a short wrinkled pod and one sunken at the stem there is more waste to it.

A number of pickings of good, mature, green chile for canning purposes can be made during the season. The earlier the plants come into bearing and the better care they receive, the more green chile they will produce. At the station during the season of 1907 the experimental field planted plats were picked six times, while the transplanted plants from the cold frame were picked nine times. The picking of the green chile is somewhat slow, and the pickers, aside from being careful not to break the branches containing smaller pods and blossoms, should be quick with their hands and able to tell at a glance a pod that is mature enough for the cannery without having to stop and examine it. It takes some little experience to pick good chile and pick it fast. At the station it was observed that young inexperienced pickers at first picked very slowly, and the larger part of the chile they picked had to be sorted over before it was sent to the cannery. The amount of chile the average experienced person can pick depends upon the crop of mature pods the plants have at the time. Since the amount varies it is impossible to give definite figures for all cases, but from six different pickings at the station in 1907, the men picked from 35·5 to 45·5 lb. per hour.

Green chile can be kept for home use for some time after the crop has been gathered, by placing the green pods in dry sand, or, by piling up the vines and keeping the pods from freezing. In this way green chile may be had for use part of the winter months. If green chile is placed out in the sun it will turn yellowish white, and become worthless, while if placed in the shade it will colour up, and can be used as red chile.

RED CHILE.

Red chile is the term generally used for ripe pods whether they are red, black, or other colours. If no green chile is picked from the plants during the summer season two different pickings may be made of ripe pods. The first picking may be made whenever there are enough of the ripe pods on the plants to pay, while the last picking is made just before it freezes. The pods ought not to be picked until they are perfectly ripe. If picked partially unripe the green parts of the pods will be of a yellowish white colour when they are dried in the sun. After the red chile is picked it has to be dried before it can be stored. Two methods for drying the chile are practised by the Mexican chile growers. The most common way is to pile it up in medium-sized piles from 4 to 6 days. At the end of this period the chile is spread out on the ground about two pods thick, and left there until thoroughly dried, when it is stacked and stored or shipped away.

It is claimed that by leaving the chile in piles for a few days before it is spread out the dry pods will be more fleshy than when not submitted to this treatment. The other and less common way of drying it is by tying four or six pods together and making long festoons which are then hung out where they will dry.

Air-dried chile is very light and bulky. The dry pods will not stand any pressing without breaking. The time it takes chile to dry when spread out on the ground in the fall varies from 6 to 8 weeks. The red chile loses considerable in weight during the drying process. The amount of weight lost depends to some extent upon the quality of the pods. If the pods are all perfectly ripe and sound when picked the loss will be less than if the pods are more or less green. From 2,819 lb. of fresh ripe chile, containing some pods that were not perfectly ripe, put out to dry 8th November, 1907, 747 lb. of dry chile were sacked and weighed 2nd January, 1908. According to these figures there were 2,072 lb. loss, or 73.5 per cent. of the original weight. On 8th November, 1907, 50 lb. of selected fresh ripe pods were spread out to dry, and from this lot 16 lb. of the dried chile were weighed and sacked 2nd January, 1908. Thus it is seen that the loss in weight was 34 lb., or 68 per cent. Another 50 lb. of good, matured green chile were spread out on the same date, and when dried it weighed 10 lb. In this case the original weight was reduced 40 lb., or 80 per cent. From these two tests it is noticed that the difference between the green and ripe chile was 6 lb., or 12 per cent. in favour of the ripe pods. The amount of red chile produced per acre can be increased by drying the green chile picked in the fall in the shade.

In the preparation of the red or green chile for use the flower stems, seeds, and veins* are discarded, and represent so much waste. Aside from being quite a task to remove the stem and seeds from the pod, the fine dust coming off from the chile is exceedingly irritating to the nostrils and eyes. In order to obtain some data on the proportion of stems, veins, and seeds to the pod, and the time necessary to remove these, 50 lb. of ripe, dry pods were weighed, and the waste removed. The following are the results in figures:—29 $\frac{3}{4}$ lb. of clean pods, 5 $\frac{1}{4}$ lb. of stems, $\frac{1}{2}$ lb. of veins, and 14 $\frac{1}{2}$ lb. of seed. It took 23 $\frac{1}{2}$ hours to remove the stems, seeds, and veins from the pods. From these figures it will be seen that there is a large waste to red chile. Taking into consideration so much waste and the amount of work required to remove it, and the disagreeable features of the work, it would be better for the consumer to buy the cleaned pods. Ordinarily the red chile is retailed locally at 15 to 20 cents per lb. Taking the 50 lb. of red chile, they would bring from 7.50 dollars to 10.00 dollars. Then, according to these figures, the consumer pays 15 to 20 cents per lb., or 3.03 dollars to 4.05 dollars for the 20 $\frac{1}{4}$ lb. of waste in the 50 lb. of chile bought, plus 2.35 dollars, the cost

* The word *veins* as used in this bulletin is a literal translation of the Spanish word *venas*, which is the common Spanish name given in this section to the *placenta* or the pithy core in the chile pod. The author has adopted the word *veins* on account of not having found a better common term for the *placenta*.

of removing the stems and seed. In other words, the 29 $\frac{3}{4}$ lb. of cleaned pods cost the consumer 9·85 dollars to 12·35 dollars, or approximately at the rate of 33 to 41 cents per lb. It might be said that the consumer could better afford to pay 30 to 40 cents per lb. for the cleaned pods than 20 cents for those uncleaned.—Extract from "Bulletin No. 67," New Mexico College of Agriculture.

CASSAVA.

FAMINE-FIGHTING IN INDIA.

We have frequently advocated in this Journal the planting of cassava in Queensland. It is from the tubers produced by the cassava or manihot plant that the tapioca of commerce is obtained. Every housewife knows the value of tapioca as an excellent and nutritious form of farinaceous food, especially in the form of light puddings for children and invalids. Although the plant thrives splendidly on all our coastlands, and even in the Far West of the Central Districts, nothing has yet been done in the way of turning the tubers to practical use. We see these exhibited at every agricultural show, and their value has been explained over and over again by the exhibitors, but all to no purpose. Yet Queensland imports large quantities of tapioca from other countries.

Cassava flour from the West Indies is largely used by textile manufacturers in Lancashire and elsewhere, and the price paid for it ranges from £14 to £16 per ton. In Queensland the yield all over the State will average 9 tons per acre, and in such rich soil and in such a climate as North Queensland, considerably more. An acre of cassava is worth more than an acre of sugar-cane. As a feeding stuff for cattle, the actual profit on feeding bullocks on cassava is nearly 50 per cent., on maize-fed bullocks it is 15 per cent., and, as to cost, it is two-thirds in favour of cassava. At the Florida (U.S.A.) Experimental Station, a profit of 59·10 per cent. was made by fattening beasts on cassava.

An acre producing 40 bushels of maize yields 1,187 lb. of starch, while an acre of cassava, producing only 6 tons of tubers, will yield 2,400 lb. of starch. This starch contains 3 per cent. of sugar and 1·68 per cent. of fibre. Maize contains 4 per cent. of sugar and 2·20 per cent. of fibre. A rainfall of 14 in. per annum is sufficient to secure a heavy crop of cassava, as it is peculiarly drought-resisting, and will flourish in arid regions as well as in the most humid.

There are two kinds of cassava, the sweet and the bitter. The former is innocuous, or at least contains very little of the poison known as hydrocyanic acid in its skin. The latter contains a far greater quantity, but the poison is entirely confined to the juice. So volatile is prussic acid that if the sliced roots are left in the sun for a while they may be eaten by man or beast with impunity. Cassava flour is worth about £6 per ton in England.

We are led to revert to the subject of the growing of cassava by an article which appeared on the 30th September of this year in "The Morning Bulletin," Rockhampton, taken from the London "War Cry" of 20th June last. From this it appears that the Salvation Army in India is doing good work in helping the famine-stricken Indians by means of plentiful supplies of cassava flour. A Mohammedan maulvi or priest had an interview with Commissioner Booth-Tucker, and the latter, after explaining the objects of the army, got on to the subject of its work in fighting the famine by means of cassava flour. Addressing the maulvi, who was deeply interested and most willing to assist, Commissioner Booth said:—

"Well, you see, Maulvi Sahib, men have bodies as well as souls, and often the best way to reach the soul is through the body. While we are seeking to minister to their spiritual needs, we see them battling desperately, and often unavailingly, with temporal distress, and our religion would not be worth much if our hearts did not go out in longing desire to help them. For instance, there is this terrible famine and scarcity with the consequent high

prices of food prevailing all over North India. When we were in Travancore a few months ago we found the famine did not trouble them at all. We asked the reason, supposing it to be the abundant rainfall and rich soil. But it was not so. They, too, had been subject to famine and scarcity till a plant, well known to commerce and largely grown in other tropical climates, had been introduced, and this proved a splendid famine-fighter and drought-resister. This food was then actually selling at 80 lb. to the rupee, though famine rates had affected the prices of rice, wheat, and all other ordinary grains. On all sides we saw the familiar plant growing. No cottage was without its little garden patch. It was the cassava or manioca, the tapioca of commerce. But here, as a food, it had been Indianised to suit the tastes of the people. The large tuber roots, resembling huge potatoes, were boiled, sliced, sun-dried, and finally ground into a fine and tasty flour, which could either be eaten alone or mixed with other kinds of flour, according to the taste and resources of the family. Thus, every little homestead had been rendered famine-proof, as a tiny patch would grow sufficient for a year's supply, and the surplus could be sold in the open market. An average crop would range from 6 to 20 tons per acre, according to the care and cultivation it received, and its value would run from 100 to 300 rupees per acre, according to the demand there might be for the food."

"But," exclaimed the Maulvi, "can this crop be grown in the Punjaub? I have more than 1,000 vigahs of land, and should like to try some."

"Certainly, Maulvi Sahib," I replied. "It will grow in almost any part of India. In fact, we are even trying some here in Simla, though I fear it is too cold. But up to an elevation of 4,000 ft. it will flourish. It does not need irrigation, and if planted just before the monsoons, will take care of itself. It will also resist drought. And another advantage is that it does not need to be harvested quickly like wheat and ordinary grains, but can be left in the ground for months without spoiling. In its sun-dried form it will keep for a year, and can be transported to any distance in any climate."

"It seems, indeed, to be a godsend," said the maulvi. "My manager tells me that it makes delicious cakes, as well as ordinary chappatties, and that it mixes with almost any flour, but, best of all, with wheat flour, which, as you know, is the principal article of food here in the Punjaub."

The maulvi was quite right; cassava is a godsend to the vast famine-stricken territories of India.

It is only 3 months since we started our famine-fighting campaign, and here in brief are some results already accomplished—

Arrangements have been made for securing 30 tons of the new food.

Three tons have been supplied, at the request of the Famine Commissioner, to the poor houses in the United Provinces. The Government officials report that in each case the people have taken to the new food, although previously they were very sceptical about its acceptance.

Our orphanages have also been supplied. The children have taken to the food, and have asked that it may become permanent on their bill of fare.

The Indian grain merchants, who have their fingers upon the pulse of the people all the time, after carefully testing the food, have pronounced strongly in its favour, and, were we willing to do so, would gladly take from us all we can supply.

In large gatherings of our Indian soldiers we have shown the food and given particulars as to probable prices. They have begged us to make immediate arrangements for supplies to be obtained and distributed.

We have obtained cuttings of the cassava plants, and have distributed them where we have land, arranging for the regular cultivation of the plant, and for its introduction and explanation to neighbouring farmers.

We have begun to form a kind of alliance with leading Indian merchants for the regular growth, production, and distribution of the new food, thus helping to erect all over India one of those Nature-made barriers against the

ravages of famine. A new era of hope in connection with this terrible scourge is thus opened up.

By the sale of the food at a price which will cover initial expenses, and is yet from 50 to 100 per cent. cheaper than all other grains, we are able to turn the money over and over, and cover a far wider area than would otherwise have been possible.

At the same time, by the introduction of this simple plant, the Salvation Army appears before the people of India in an altogether new light, and the bread of life is rendered doubly welcome, because with the offer of salvation we are able also in a time of dire distress to bring the "bread that perisheth."

LEAF-BLAST OF THE SISAL PLANT.

The "Journal d'Agriculture Tropicale," always prompt to note anything of importance in connection with tropical agriculture, remarks, on the subject of sisal leaf-blast, which we explained in our issue of last March to be no disease, but only an effect of certain weather conditions:—"Under the name of 'leaf-blast,' a physiological trouble has been reported from various districts, where plantations of sisal exist, characterised by the presence on the leaves of large and numerous red or yellow blotches, which very shortly cause the decomposition of the leaves and fibres. This trouble made its appearance in Mexico about 30 years earlier, and caused grave anxiety to the planters, who believed it to be a new parasitic scourge. Happily, there was no need for a scare, as earnest study of the affected leaves disclosed the fact that it was a question of an accident of a physiological nature, due to great heat supervening on a rainy period.

"The leaf-blast has been observed in many parts of Queensland where the cultivation of sisal is rapidly extending, as well as at the Solomon Islands. It has been noticed that the damage was most severe on plants growing in rich soils. The only method of forestalling the damage is to decorticate the leaves immediately the first spots appear—that is to say, before the fibre has lost its value; but this means can only be recommended in the case of leaves sufficiently developed for the decorticating process."

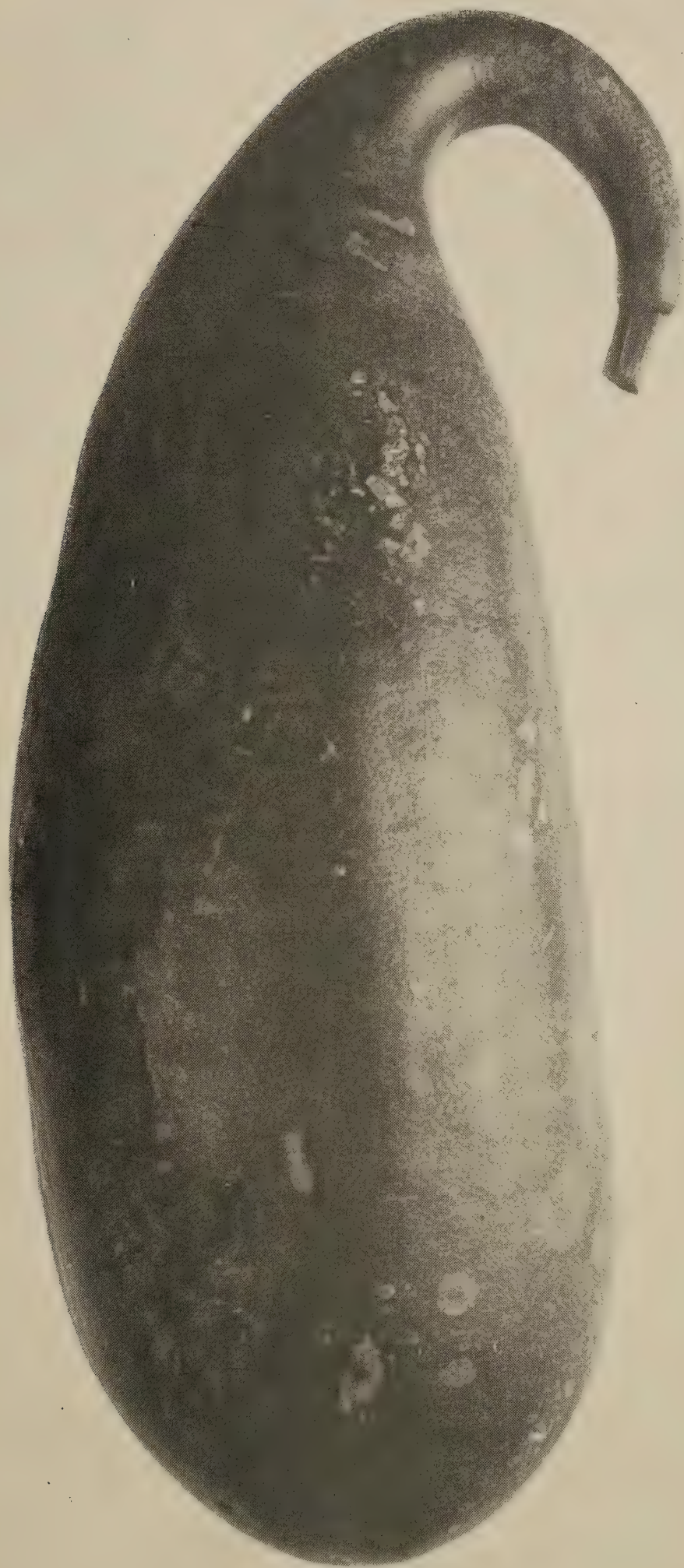
We have to thank our excellent contemporary for this advice, which will be of value to all planters here who have machinery to enable them to act on it.—ED. "Q.A.J."

CALABASH PIPES.

By R. S. NEVILL.

Herewith is submitted a picture of the celebrated pipe calabash of the shape desired by pipe manufacturers. These pipes are becoming very popular, and are, it is said, fast supplanting the meerschaum. It is said they are the sweetest smoking pipe of any, and colour well and prettily. These calabashes are worth £12 per 1,000, or nearly 3d. each, when of the right shape, and should prove a very profitable thing for the small farmer. They are grown like pumpkins, the vine allowed to run along the ground. The calabashes should occasionally be turned over to keep them from discolouring. Care should be taken that they are placed in such a position as to get the proper curve on the stem, for without curved stems they are valueless. Getting the proper curve can be assisted by so placing the calabash as to force the curve, and fixing it in that position so that it will not move. This can be done with clods or stones. In the issue of the "Queensland Agricultural Journal" for December, 1907, will be found an illustration of a pipe manufactured from a calabash gourd.

The Government Botanist, Mr. F. M. Bailey, gives it as his opinion that these gourds will do best above the range, as in the warmer coastlands they might produce gourds too large for the purpose required.



CALABASH GOURD.

Animal Pathology.

TICK FEVER, OR REDWATER.

By SYDNEY DODD, F.R.C.V.S., Principal Veterinary Surgeon and Bacteriologist.

This disease is known throughout the world under various names. In America it is known as Texas Fever, in consequence of its having in that country first been observed in the State of Texas. The name by which it is commonly known in Queensland is Tick Fever, or Redwater. This latter synonym is an unfortunate one, as it gives the impression that Redwater is essential to this complaint; in fact, numbers of stock-owners in Queensland go so far as to declare that Tick Fever and Redwater are two quite separate diseases. It will, however, be seen later on that the passing of red-coloured urine is not at all an essential feature in every case of the disease.

Other names are Moor Ill, Wood Ill, Blackwater, Bovine Distemper, Bloody Murrain, Tristeza, Bovine Piroplasmosis, Bovine Hæmoglobinuria, &c.

DEFINITION OF THE DISEASE.

Tick Fever is a specific infectious disease of the blood of cattle, caused by the introduction and multiplication of very minute animal parasites (or protozoa) belonging to one of the smallest forms of animal life, these parasites being conveyed to the affected animals by means of certain cattle ticks. The disease is marked by high fever, by destruction of the small red cells of the blood, thus liberating the red colouring matter, which may be so great when excreted by the kidneys as to colour the urine red, by enlargement and softening of the spleen or melt, enlargement of the liver, jaundice, anæmia, emaciation, and death in from 10 to 90 per cent. of cases in which the disease makes its appearance naturally. The disease is not contagious—that is, provided an animal suffering from the disease were free from ticks, it cannot infect an animal placed in contact with it. It is not transmitted by the air, saliva, manure, urine, or in any other known manner save by cattle ticks or the direct inoculation of infected blood.

HISTORY OF THE DISEASE.

The place where this disease first originated is unknown, but it has been known to exist for some hundreds of years (although its cause was not then recognised) in some countries of Europe, such as South France, England, Ireland, Italy, Turkey, Roumania. It is also prevalent in the United States of North America, Central and South America, West Indies, Mexico; South, East, West, and North Africa; Finland, practically the whole of Southern Asia, Philippine Islands, Germany, South Russia, and lastly Australia. In countries where the disease has existed for a long period the annual loss is not so great as in those places where it has been newly introduced, owing in a great part to the fact that in the former countries cattle contract the disease when quite young, at which period of life they are very resistant to the effects of Tick Fever, and then immunity is maintained by subsequent repeated tick infection so long as they remain in an infected district. This is well illustrated in Queensland. When Tick Fever first broke out in the North the losses were enormous, but at the present time one hears little about the losses in the Northern districts, owing to the fact that practically all the cattle there are now immune, and the losses one occasionally hears of are chiefly due to breaking down of immunity by some means, or the introduction of susceptible cattle. On the other hand, in Southern Queensland, where the disease is comparatively quite new, the losses are very heavy at the present time

wherever cattle become naturally infected. It is no uncommon thing to hear of a small farmer losing almost the whole of his cattle through Tick Fever. The virulency of the disease, however, varies a good deal in different countries and in different districts.

Owing to the fact that there are quite a number of persons in Queensland who deny that cattle tick has anything to do with the disease known as Tick Fever, it is thought necessary to give a short account of the events which took place in the United States, resulting in the discovery of the organism which causes the disease, and succeeded beyond dispute in proving that the cattle tick was the agent which conveyed the organism from the blood of one animal to another.

In America it was observed for a number of years that, whenever cattle were transported from the Southern to the Northern States, Northern cattle, which passed subsequently over these roads or grazed on the pastures over which the Southern cattle had fed, invariably became ill, and the majority died, although the Southern cattle remained healthy. In the same way Northern cattle that were taken South almost always were attacked with the same disease. The enormous losses caused scientific observers to study the disease, with the result that it became evident it was too dangerous to allow Southern cattle to go North during the hot weather, and in 1891 a quarantine line between the Northern and Southern States was established. Dr. Curtice, an American veterinarian, was the first to suggest that ticks might play some part in the disease.

In 1888 the organisms causing Tick Fever were first seen in the blood of Roumanian cattle by Babes; but Smith, in the United States, was the first, in 1889 to recognise their true character, while in 1889 and 1890 Kilborne, also in the United States, proved by experiments made under natural conditions that the presence of the cattle tick was essential to the transmission of the disease. In experiments made in the United States in 1892 and 1893 it was found that animals which had gone through a mild attack of tick fever, when exposed to tick-infested pastures, had obtained a considerable amount of protection. The methods adopted subsequently for producing such a non-fatal attack were by injecting blood into an animal from one which had already gone through an attack, or by the less certain way of placing ticks on a susceptible animal. By the term "susceptible" animal we mean one which is liable to the disease. In 1895 to 1897 further experiments were made with the object of proving that animals could be protected by inoculating them with blood from an infected beast, and in 1897 inoculation experiments were first carried out in Queensland. More recent work appears to be directed towards finding a satisfactory dip which will not only destroy ticks but keep them off an animal for some time, or clearing the land of ticks, as in the United States, and also towards the discovery of some material which will destroy the organisms in a sick animal's body, and so reduce the heavy mortality among affected animals.

Turning to Queensland, it appears that Tick Fever was first seen in the Northern Territory of South Australia in 1885. Of course, the exact nature of the disease was not then known. Whether the tick and the disease were introduced into Australia simultaneously is not known, though from evidence to be obtained it probably was the case. Nor is it known how or when the disease was first introduced, but it appears to have been prevalent on the Roper River, in the Northern Territory of South Australia, some years before it was reported in Queensland. In Queensland, at any rate, the evidence goes to show that the cattle tick did not exist before the advent of Tick Fever. Why the disease should have been confined to the Northern Territory for a time, and then make such rapid strides, is easy to comprehend when one studies the development of the cattle industry in Queensland of recent years. No great spread took place until boiling-down

works were erected on the Albert and Norman Rivers. What occurred then was similar to that just described as occurring in the United States. Although the travelling cattle remained apparently well, the cattle living in the country covered by the former, became ill and died, and an old stockman who lived in Northern Queensland informs me that at first the disease was strictly confined to the stock routes. In 1895 Mr. Pound, who investigated the disease with the late Dr. J. S. Hunt, succeeded in establishing the fact that it was identical with Texas Fever of America. A commission, consisting of Dr. Hunt and Mr. William Collins, was sent to the United States in 1896 for the purpose of more fully establishing the identity of the two diseases.

When the nature of the disease was ultimately recognised in Queensland, steps were taken by the Stock Department to prevent its spread, but in 1895 it had spread south and east, and in 1896 it had reached the eastern coast. In spite of the various regulations as to quarantine of cattle, dipping, &c., the disease gradually extended its area until, at the present time, the whole of the coastal district and inland as far as the coastal range may be said to be more or less infested with ticks, and in those localities where cattle ticks are present, but no tick fever, it only needs the introduction of an animal which has recovered from the disease to set up a fresh centre of infection.

It is recognised that a mere statement that ticks convey the disease known as Tick Fever is not sufficient unless it can be substantiated by proof, and, therefore, it is considered necessary to give a brief summary of what has been done in this direction by various scientists.

To find out whether the disease could be communicated from infected to non-infected susceptible cattle in the same paddock without the aid of ticks, ticks were carefully removed from infected cattle. In this way no ticks could mature and infest the ground. The clean cattle were then placed in a clean paddock with non-infected susceptible cattle. The result was that the latter all remained healthy, proving that ticks were necessary to convey the disease. To prove that Tick Fever could be produced by ticks alone, without infected cattle actually being present, mature ticks were scattered about clean paddocks, and susceptible cattle placed therein contracted Tick Fever. Finally, it was proved that young ticks hatched out in glass tubes in the laboratory from the eggs of infected ticks could, when placed on susceptible cattle, set up the disease at any time of the year; and I myself have seen eggs of ticks dropped from infected cattle in South Africa, sent to London, hatched out in a laboratory there, the larvæ or young ticks placed on a cow, and producing the disease 7,000 miles away from the place where the mother of the ticks became infected. At one time it was thought that something in the manure of cattle was capable of infecting animals. That this was not the case was proved in experiments where the dung of infected cattle was scattered over pastures, and also where blood and crushed organs of animals dead of Tick Fever were scattered about. Susceptible animals grazing over this land from which ticks had been cleared off remained quite healthy.

THE CAUSE OF THE DISEASE.

The direct cause of Tick Fever is a very minute parasite known scientifically as *Piroplasma bigeminum*. It belongs to the lowest known form of animal life. This organism is present at some period in the blood of every animal affected with Tick Fever, although in some cases it is extremely difficult to find, even with prolonged search with a microscope by an experienced observer; and by injecting blood containing it into a susceptible animal it will always set up the disease, thus proving that the organism is the cause. In an article like this one, which is written for the information of stock-owners, it is not necessary or desirable to go into scientific details as to what

takes place when this organism gains entrance to the blood, beyond stating that, after gaining the circulation, various changes occur in the parasite, which may be observed if the blood is kept under observation under the microscope. At first a single small body is seen inside the infected red cell. This, later on, divides into two incompletely separated small round bodies. Then these two bodies gradually enlarge, until they become pear-shaped and connected by their narrow extremities (hence their scientific name). At this period of the disease about 1 or 2 per cent. of the red cells are invaded, very rarely as many as 10 per cent. These parasites at this stage, fill up about a third of the red blood cell. The infected red cell then shrinks and breaks up, liberating the parasite and also the colouring matter of the blood, which is excreted by the kidneys. In bad cases the destruction of red cells is so great that their number may fall from 7,000,000 or 8,000,000 per c.m.m. (their normal number) to 2,000,000 per c.m.m. or even less.

LIFE HISTORY OF THE CATTLE TICK.

A knowledge of the life history of the cattle tick is very important, as without this, it is impossible to explain many features of the disease, or to take proper steps for preventing its spread. Mr. Tryon, the Government Entomologist, has worked out the history of this tick, and the lengths of time occupied in the various stages are those given by him.

The Queensland cattle tick (*Rhipicephalus australis*) is, as its popular name indicates, chiefly found on cattle, but it is also seen on horses, on which animals it may mature. It is also said to develop on sheep. In describing the life history of the tick it will perhaps be most convenient to start at the point where the mature female has dropped off its host to the ground, when it seeks a sheltered spot and lies quietly. Within 3 days, according to Tryon, the female tick commences to lay eggs, which operation may last from 10 to 21 days. The number of eggs deposited varies from 1,500 to 3,000. As the egg-laying proceeds, the tick shrinks in size until it finally shrivels up and dies when the process is ended. The eggs are brown in colour, with a waxy look, and generally clustered together in masses. They are very resistant to the adverse conditions of temperature, and will survive exposure to very low temperatures or to that of summer heat, providing they are not exposed to the direct rays of the sun. Under favourable conditions, depending upon warmth, moisture, &c., the eggs develop in from 21 to 42 days, but, if conditions are against them, such as a cold winter, they may remain dormant for several months, and then hatch out when the weather becomes warmer. The young tick or larva is a very small parasite, about the size of a very small pin's head, or even less. It possesses six legs, and is of a light-brown colour. Soon after the hatching it crawls, together with a number of its fellows, up blades of grass, sticks, shrubs, posts, &c., until large clusters of them are collected ready to seize hold of anything that may pass by. In this condition the young tick is able to live some months without food, but, providing the tick cannot find a suitable animal to which to attach itself, it cannot develop, but ultimately dies. Should, however, an ox brush against them, they immediately attach themselves to the beast, selecting for preference the soft parts of the skin, such as inside the thighs, flanks, or forelegs, escutcheon, belly, &c. Once there, they insert their rostrum or beak into the skin, and commence to suck blood. It must be pointed out that they can cause fever at this stage, even though they can scarcely be seen. After being on the animal about a week, the larval tick moults or casts its skin, and becomes a nymph. During this change it acquires another pair of legs, so that it now has eight. The tick does not drop off its host, however, but remains attached. At about the second week of its attachment the tick changes its skin a second time, and is now an adult. At this stage of life the male and female ticks are about the same size. The female

does not increase in size until after it has been fertilised by the male. This takes place shortly after the adult stage is reached. After this, the female gradually increases in size until about 24 hours before dropping, when it swells up enormously. This rapid development of the female accounts for the opinion held by some stock-owners that their cattle were quite free from ticks one day and the next day ticks were dropping off them. The entire period spent by a tick upon an ox is rarely less than 3 weeks, and in cold weather it is sometimes considerably longer. The male does not increase to the great size that the female attains, and when it has accomplished its end by fertilising the female it dies. When the female tick has attained its full size it drops to the ground, and soon commences to lay eggs, thus completing its life cycle, the whole period occupying from 6 to 10 weeks in warm weather, but longer in winter. This is supposing the young tick finds a host as soon as it is hatched.

Although the young ticks are very active, neither they nor the adults are able to travel very far, but they may be transported long distances by mechanical means, such as floods, winds, animals, carts, railway trucks, clothing, &c. Mr. Pound reports having found them carried mechanically on goats, kangaroos, and wallabies, hence the always present danger that new areas may become tick-infested by other means than travelling cattle or horses.

It is necessary, before the disease can appear in a district, that a fully mature female tick shall have developed upon an animal carrying the causal organism of Tick Fever in its blood, and that the eggs laid by these ticks hatch out and the larvæ attach themselves to susceptible cattle. While the ticks are sucking blood to enable themselves to live, they are at the same time inserting the parasite of Tick Fever into their host. These parasites develop in the blood of the ox, and an attack of Tick Fever results. Once the tick has dropped off a beast it is very rarely that it attaches itself again to another animal, so that it is seen that the tick does not convey the disease direct from one animal to another, but that the organism is passed through the eggs of the tick to the larval ticks, and it is these latter which have the power of infecting cattle.

It may not be out of place here to point out one or two of the arguments brought forward by some to try and show that ticks have nothing to do with Tick Fever.

1. They say that there are localities in Queensland which have only recently been infested with ticks, where the cattle are highly susceptible to Tick Fever, and yet no cases of the disease occur! This may be explained as follows:—

It has been previously pointed out that cattle ticks can and do live and mature on horses. Now, the horse is not susceptible to Cattle Tick Fever, and when a tick has matured on this animal it loses its infectious property, and from it springs into being a non-infected race of ticks. It will thus be readily understood that horses can carry ticks into a new Tick Fever free district (it is no new thing to hear that a stock-owner's cattle have been dipped in order to free them from ticks, but the horses have been forgotten), and the progeny of these ticks may get on to susceptible cattle, but until they are able to suck blood containing the organism of Tick Fever from a beast, naturally these ticks are powerless to transmit that which they never had.

2. It is also sometimes brought forward as another proof against the transmission by ticks, that cattle go down with Tick Fever and no ticks at all are to be found on the animal. Now, if ticks really are absent, and very often they are so small that they escape notice unless carefully sought for by an experienced searcher, it may be explained in this way. Probably these particular animals had already recovered from an attack of Tick Fever, and had become so-called "immune." As a matter of fact, in the strict sense of the word, they are not immune, but chronically infected, as they all carry the causal organism

in their blood. As, however, will be presently shown, this immunity is not absolute, but as the result of impaired vitality, due to various causes, such as over-driving, injury, starvation, rough handling, &c., an animal may lose its immunity, and suffer from another attack of Tick Fever without having a tick on it!

With regard to young calves: A calf has at the time of birth, and for some months after, such a great power of resistance that it may go through an attack of the disease and an owner never notice anything wrong with it. This resistance lasts, but in a diminishing degree, until the age of about nine months. One of the reasons for this state of affairs may be that the power to manufacture fresh red blood cells is very great in young animals, and that the destruction of these cells by the causal organisms of Tick Fever is not greater than the young animal's vital power can cope with, although this does not explain every feature.

PERIOD OF INCUBATION,

or the time elapsing between the exposure to ticks and the appearance of the disease. This depends a good deal upon the temperature, and the stage of development of the ticks the animal is exposed to. It will be understood that if a susceptible animal is placed in a hitherto clean paddock with cattle from which ticks have just fallen, the time before the disease shows itself in the former animal will be much longer than it would had it been exposed after all the eggs had hatched out and the young ticks were waiting for their host. In the first place, it may be from 30 to 60 days before the animal is observed to be ill. In the latter case, symptoms may set in from 10 to 15 days in summer. It is thus seen that, after natural exposure to tick infection, the disease develops in from 10 to 60 days, depending upon weather conditions, the longer periods being in winter and the shorter in summer—cold retarding and warmth assisting the hatching of the eggs. In the summer, symptoms may become apparent in as short a period as 10 days after the young ticks have attached themselves. With artificial inoculation of blood, the period of incubation is shortened again, and symptoms may appear in from 6 to 10 days, seldom, however, in the former, but chiefly in the latter time.

SYMPTOMS.

The severity of an attack usually appears to be in direct relation to the age of the animal—that is, very young animals, as a rule, suffer slightly, whilst aged animals suffer severely and often die. Most writers on Tick Fever describe two types of the disease—viz., (1) the acute, and (2) the chronic; but, for convenience, the two will here be described together, and the points in which the chronic or mild type differs will be subsequently indicated. The first thing usually noticed, if the animal is under observation, is a rise of temperature, and this may exist two or three days before any other symptom is seen. The temperature may be 104 degrees Fahr. on the first day of illness, and may then increase to 106 or 107 degrees. The more acute the case and the hotter the weather, the greater the rise. A sudden drop in the temperature after the animal has been fevered a few days is a bad sign, as it indicates collapse, and perhaps death. The pulse is increased in frequency, the animal begins to breathe more rapidly, it looks depressed, ceases to chew the cud, refuses to eat, and the muffle is hot and dry. It leaves the herd, and lies down or stands alone with its back arched. The head is lowered, and the ears droop. The foregoing symptoms, however, are not special to Tick Fever, as cattle show them in other cases of illness. The eyes often become swollen and sometimes jaundiced; if made to move, the animal staggers as if drunk. Saliva dribbles from the mouth and also collects around its corners. In some cases delirium may set in, and the animal charge anyone who approaches. If pregnancy is advanced, the cow often slips her calf. The supply of milk is diminished or stops altogether.

Constipation is present in the early stages, but may be followed by diarrhoea. In the more advanced cases, the dung may be stained a yellowish-brown by bile. In the severe cases, it is to the urine that one's attention is most frequently drawn. It has already been pointed out that one of the results of the growth of the causal organism in the blood of an infected beast is the destruction of the red cells of the blood, thus liberating the colouring matter. This is excreted by the kidneys, and gives the urine its red colour. At first, the urine is thick and muddy in appearance, then in bad cases it often increases to a red colour. Sometimes the colour may be such a deep red that the urine looks more like stout. As has been stated, destruction of red blood cells goes on in all cases of tick fever, but in the mild cases this is so slight or so gradual that to the eye no change takes place in the urine at all. It appears quite normal. Hence the opinion commonly expressed by stock-owners in Queensland that there are two quite distinct diseases—viz., Tick Fever and Redwater—because, they say, in Tick Fever there is no Redwater. It will be seen that the name "Redwater" is not a good one for this disease, because it does not cover all cases. In advanced cases of the disease, the blood becomes watery owing to the great destruction of cells. The blood is a good means of diagnosing Tick Fever, because if one takes a small drop of blood, smears it on a glass slide, stains, and then examines it under a microscope, one can generally find some of the organisms in the blood cells when the fever is at its height, but they are often very difficult to find when the animal is recovering, and it is, of course, not a practical means of diagnosis for a stock-owner to adopt.

As to the usual course of the disease: If the case is a very severe one, death usually takes place in from 4 to 7 days after symptoms set in, but if the animal be made to exert itself, death may occur in from 24 to 48 hours in these cases.

In non-fatal cases, the temperature gradually falls to normal (about 101.5 degrees Fahr.), the animal gradually regains its appetite, but recovery is very slow, and may take weeks or even months. The mortality ranges as high as 90 per cent. in hot weather, but in colder weather, or where the type of the disease is milder, the death rate is much lower. The mild or chronic cases are usually seen in young calves, or in animals that have survived one attack and their immunity has become broken down. In these cases the temperature does not usually go above 105 degrees Fahr. There is loss of appetite, constipation, loss of condition, but there is usually no Redwater. In some cases a relapse may occur in about three to six weeks from the disappearance of the acute symptoms, hence the necessity for taking care of an animal when it is recovering.

[TO BE CONTINUED.]

ERRATUM.

STOMACH WORMS IN SHEEP.

An error occurred in our reply in the last issue of the Journal to Mr. R. Irving, on the value of lucerne for reducing the number of stomach worms in sheep. It was there stated that green lucerne had a "costive" effect. This is obviously a mistake; it should have read "a laxative" effect.

Statistics.

COMMONWEALTH METEOROLOGY.
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1907.				1908.								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
<i>North.</i>													
Bowen	0·51	0·06	3·71	6·39	10·14	5·63	9·46	3·73	0·99	0·45	0·88	0·51	0·96
Cairns	1·35	0·68	5·35	28·33	27·02	8·03	20·60	5·99	3·05	0·59	3·70	2·12	0·74
Geraldton	1·36	1·42	6·45	33·82	44·39	13·27	39·00	14·23	18·52	2·64	8·11	3·66	2·81
Herberton	0·12	0·17	3·41	9·57	9·29	5·02	8·92	1·40	0·38	0·31	2·36	Nil	0·51
Hughenden	Nil	1·66	0·66	7·75	0·98	5·18	6·91	0·30	Nil	0·05	0·68	Nil	Nil
Kamerunga State Nurs.	1·19	0·53	2·76	29·82	...	7·47	25·75	4·60	3·363	0·76	4·85	1·58	...
Mackay	0·12	0·12	5·76	9·70	9·28	3·83	17·43	14·82	3·25	1·29	1·65	0·71	2·27
Rockhampton	Nil	0·47	3·72	4·42	3·84	9·64	9·77	2·62	0·85	0·10	1·08	0·84	0·20
Townsville	0·14	0·03	2·82	24·26	12·21	6·69	9·03	0·38	2·22	Nil	1·70	...	0·28
<i>South.</i>													
Biggenden State Farm	0·24	1·99	2·50	5·55	2·37	9·82	9·84	2·97	0·74	0·43	0·49	2·33	1·39
Brisbane	0·10	1·37	4·25	3·21	2·80	8·43	18·19	2·45	2·40	0·17	0·77	2·83	0·67
Bundaberg	Nil	1·70	2·90	2·99	4·77	2·82	7·35	4·13	0·67	0·39	0·75	1·56	1·10
Dalby	0·15	0·69	5·18	1·44	0·17	4·88	7·61	0·11	0·37	0·63	0·14	1·80	1·13
Esk	0·57	0·50	3·76	3·72	2·61	10·06	17·04	2·83	1·07	0·23	0·46	2·75	2·16
Gatton Agric. College	0·15	0·71	3·01	4·55	...	3·38	10·74	...	0·10	0·16	0·6	2·71	1·84
Gindie State Farm ...	0·16	0·61	1·57	4·42	0·20	7·17	6·25	0·02	0·112	...	0·40	1·27	...
Gympie	0·47	1·20	3·05	5·49	6·26	11·77	80·8	1·87	2·00	0·38	1·16	2·87	1·37
Ipswich	0·05	0·78	4·45	3·40	1·32	6·63	13·77	2·71	1·14	0·12	0·47	3·23	1·19
Maryborough	0·25	2·74	3·49	5·81	5·62	8·07	11·40	2·52	1·05	0·46	0·81	1·98	1·05
Roma	0·04	1·04	3·70	2·51	0·04	6·38	2·51	0·22	Nil	0·55	0·63	1·38	1·12
Roma State Farm ...	...	...	...	...	...	...	...	...	...	...	1·27	0·73	...
Tewantin	0·55	1·05	3·12	7·36	10·42	12·47	14·39	7·59	8·66	0·75	1·97	2·70	2·18
Warwick	0·01	1·37	3·25	3·13	0·76	4·52	6·65	1·40	0·15	0·80	1·24	2·99	1·96
Westbrook State Farm	Nil	1·08	4·76	3·23	0·43	8·03	1·41	1·40	00·5	...	0·49	1·97	...
Yandina	0·80	1·44	2·87	3·05	8·37	14·47	16·62	5·45	4·59	0·58	2·64	2·18	1·50

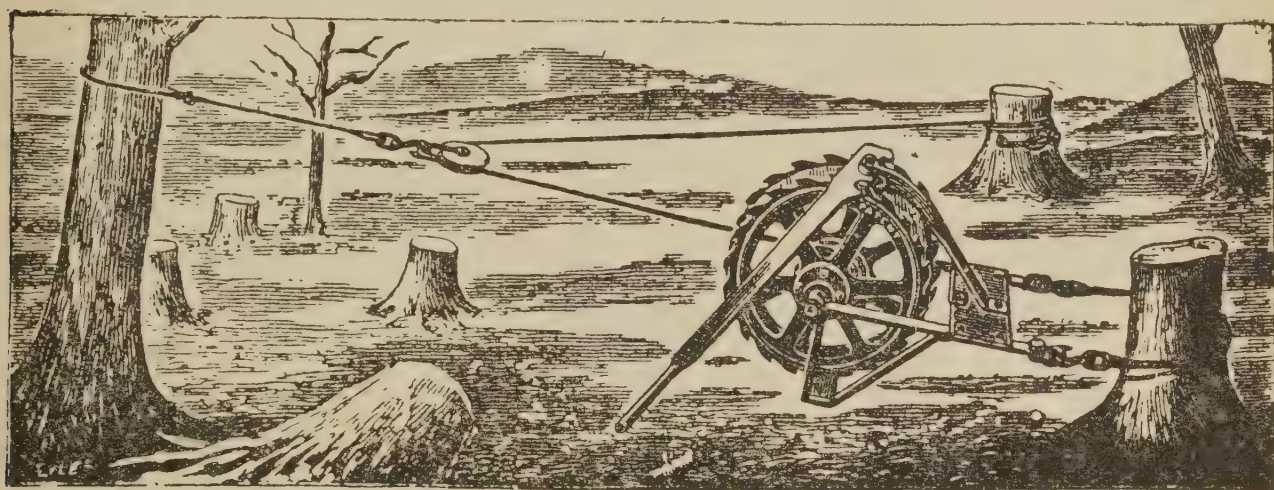
NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered as approximate only.

GEORGE G. BOND,
Divisional Officer.

General Notes.

A NEW STUMPING MACHINE.

A new tree-feller has been placed on the market by Messrs. John Cooper and Sons, of 289 Elizabeth street, Melbourne (says "The Scientific Australian"). In construction it diverges from previous types of forest devil in that the rotary hand action has been superseded by a reciprocatory one. The change provides for obviating some of the disadvantages previously experienced. Among those said to be remedied is the waste of time involved in taking grips, and the inconvenience of many in transportation. In the new appliance a continuous motion is provided by the lever attachment at the upper end of two tooth wheels, as shown in the illustration. Both the forward and backward action of the lever draws on the rope, while the lever also acts as a



Trees uprooted by this appliance will not fall upon and incapacitate either the operator or his mechanical assistant. There is a great pressure on the portion of the rope leading from the off anchor, and this draws the tree in that direction.

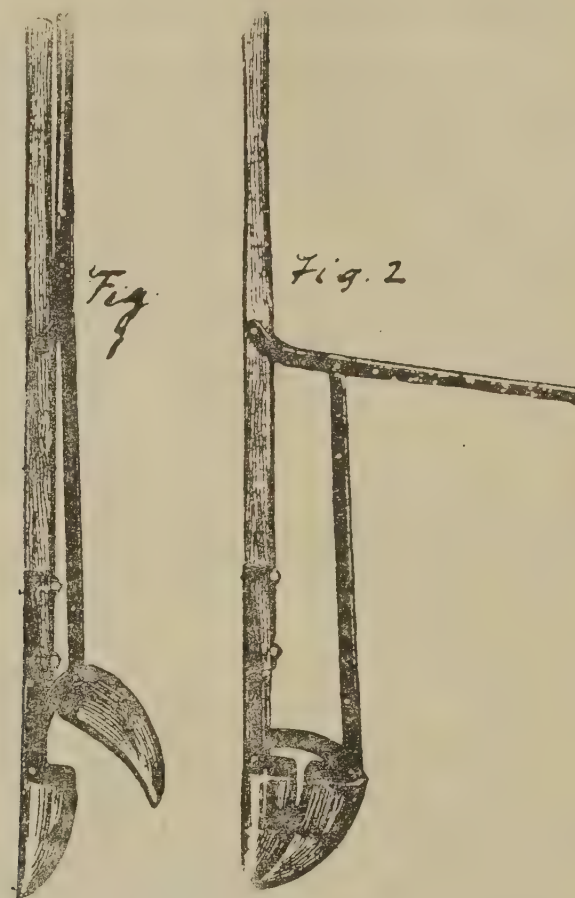
ratchet, preventing any back run should the machine be left unattended. The transportation of any previous kinds was a matter of carting, or otherwise carrying a heavy instrument to the scene of operations. This is not necessary in the Cooper devil, as it may be moved about on its own wheels. The total weight of the appliance is 250 lb., and in preliminary tests a wire cable tested to 60 tons was broken by two men. As the appliance may also be used as a crane, or for wool and ensilage pressure, as well as numerous other purposes, it commends itself to the rural community.

[This appears to be the machine invented by Mr. Dan O'Connor, a settler in the Busseton district of Western Australia. It is fully described in "The W.A. Journal of Agriculture" for September, 1908.—Ed. "Q.A.J."]

POST-HOLE DIGGING SIMPLIFIED.

Two tools are frequently used for forming post holes—namely, a pick or bar, and also a shovel. This renders the task both slow and tedious. Thanks to the Cyclone Woven Wire Company, of Swanston street, Melbourne, an implement combining the functions of a pick and a shovel is now available. In its cycle of operations it lessens, lightens, and facilitates the work. At the bottom of a handle is a box jaw, as shown in Fig. 1 of illustration. Connected with the handle, and running parallel to it, is a hand lever, controlling a second jaw. When closed the cavity of each jaw is opposite the other (Fig. 2).

With the jaws apart the digger or handle jaw is thrust into the ground at one stroke. The lever is then pressed downwardly. This forces the second jaw also into the ground, and brings it into contact with the other, thus capturing the soil, which can be quickly removed and discharged. The Cyclone Woven Wire Company report that this implement is much used for erecting "Cyclone" wire fencing and other work.—"Scientific Australian."



Showing in the first figure the appliance ready to be struck into the ground. The second illustrates position under earth, when the lever and its charge are drawn.

[This much resembles a post-hole digger placed on the market by Messrs. Alfred Shaw and Co. twenty-five years ago, in Queensland, the only difference being that the jaws consisted of two curved spades. These were only suitable for use in clayey or loamy soils.—Ed. "Q.A.J."]

A NATIVE BIRD DESTROYING THE SPARROW.

Both the "Agricultural Gazette" of New South Wales and the "Journal of Agriculture" of South Australia record an article by Mr. C. T. Musson, Hawkesbury College, New South Wales, on the discovery that a certain bird, hitherto a stranger to, or at least unknown, in many parts of Australia, is a deadly foe of the ubiquitous sparrow. In the "Lachlander and Condobolin District Recorder" (26th February, 1908), the following statement appeared:—

"Mr. A. J. Taylor, of Wheatacre, informs us that during the past few months he has noticed the presence of numbers of large birds, blue in colour, with black heads, which are very destructive to sparrows. In fact, since the arrival of these aerial cannibals, sparrows are practically an unknown quantity about Wheatacre.

"We wrote Mr. Taylor for further information, and received the following reply:—'Re the bird that takes the sparrows, it is quite true there is not a sparrow left about the place, and there were hundreds here. I tried in every way to get rid of them, but since those birds came we got rid of them. We never saw the birds before; they are strangers. There are about four of them in a flock, and they keep together. I do not think it is a hawk, though they

balance in the air like a hawk. They keep after the grasshoppers, but they are dead on the sparrows. The other birds are not frightened of them. They are very quick on the wing, and, when flying, spread out the tail.'

"Three days later came a specimen for identification: it is the Ground Cuckoo-Shrike (*Pteropodocys phasianella*). The head and neck are dark-grey; breast and lower back dull white crossed by narrow black bars; wings, upper side black; under side white; tail forked; the terminal half black. It is about the size of a small pigeon, but more slender; total length from tip of bill to end of tail, 14 in. Commonly, they make use of their legs a good deal, not flying much. Insects are the chief food, and we do not hear of them doing any damage.

"This is a most interesting fact, which should be noted by all dwellers west of the range where the bird is found. If this is to become a fixed habit, which probably it now will, it would appear that the sparrow has at least one enemy in its new abode. Sportsmen should take note and act up to the fact stated. Nature would here seem to be coming in, for evidently the cheeky little interloper is no longer to have such a peaceful time as it has had in the past. The 'balance is beginning to kick,' and we may congratulate ourselves that at least one cause is in operation which will help in bringing the sparrow down in numbers to such reasonable limits as will preserve a due balance of life forms, and not allow this particular bird to become unduly plentiful.

"Broinowski, in his 'Birds of Australia,' says:—'This bird is found in most parts of the interior of Australia, frequenting principally plains and thinly-timbered forest country. It is always seen on the ground, in small flocks, from two to eight in number.' "

LOGAN AND ALBERT A. AND P. SOCIETY.

At a recent meeting of the members of the above society a rule was passed fixing the date of the Annual Show for the last Wednesday in July.

The next show will, therefore, be held on 28th July, 1909.

ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE AND STOCK, 1907-08.

The usual Annual Report of the Under Secretary for this Department has been issued, and a copy will be supplied free to all subscribers to the "Queensland Agricultural Journal." Included in the Report are the Agricultural and Pastoral Statistics for the same year issued by the Government Statistician.

Answers to Correspondents.

DESTROYING HEAVY TIMBER.

SELECTOR, Eumundi.—

The use of saltpetre for getting rid of heavy forest timber has proved successful in many instances, and also in our own experience. Last year we saltpetred several large useless ironbark and stringybark trees, and early in the present year these were successfully burnt. One large peppermint-tree was cut down by a contractor, who did not know that the tree had been dosed, although he saw the plug, and concluded that someone had bored into the tree to see if it was sound. To his surprise, when he built a fire near the butt end, it burnt splendidly until nothing was left but a few of the smaller branches. Trees of this class, not treated, took many days and heavy labour to burn off. The quantity of the salt to use is only regulated by the diameter of the tree and the size of auger used. Your storekeeper can tell you the price of saltpetre. The reason for plugging the hole after charging is, that during heavy driving rains the water would fill the hole, dissolve the salt, which would gradually be washed out instead of being absorbed by the sap. The blood-red gum exuding from a bloodwood tree would carry out all the salt if the hole were not plugged. The quickest way of getting rid of big stumps is to blow them out or shatter them by an electric discharge of dynamite, gelignite, or blasting gelatine. The cost of the exploder is £4 10s.; 100 yds. of cable, 35s.; reel of connecting wire, 12s. 6d.; electric detonators, 25s. per hundred; dynamite or gelignite, 50s. per case of 50 lb.; blasting gelatine, 65s. per case of 50 lb.; total cost of outfit, £10 12s. 6d. The agents for the Nobel-Glasgow explosives are Messrs. Dalgety and Co., Brisbane.

Note that when the first charge of saltpetre is seen to be absorbed, the hole must be charged a second time. When the second lot is absorbed, ring-bark the tree and wait till it dies before firing. The whole process may take a year.

Cost of a stump-jump disc plough used to be £28 10s. Cost of improved stump-jump cannot be given. There has been so little call for these implements that Messrs. Smellie and Co. no longer stock them.

As you quote this Journal as the source of your information concerning clearing heavy timber, we are surprised that you apparently have overlooked the notices and advertisements of the Trehwella Stumping Jacks. These appliances are very powerful, and at the same time cheap. *See* Vol. XVI., December, 1905, and June, 1906; Vol. XVII., October, 1906; Vol. XVIII., April, 1907.

We understand from the Brisbane agent for these jacks, Mr. A. Robinson, Civil Service Stores, that Messrs. Trehwella have perfected a most powerful apparatus, worked by wire rope and one horse, which will shortly be placed on the Brisbane market, when a public demonstration of its powers will be given.

SPRAY FOR PRICKLY PEAR.

T. P. KEYS, Belmore, Surat.—

1. Mr. J. C. Brünnich, Agricultural Chemist, recommends an arsenical solution containing about 1 per cent. of arsenic. Generally, use ordinary dipping solution (used for ticks on stock), only made four times as strong as recommended for cattle-dipping.

We have used a solution prepared by Mr. Pickburn, dispenser at the Boggo-road Gaol, with great success. The solution was merely poured on to

the prickly pear by means of a watering can, without slashing the leaves. The result was that the pear was destroyed, the roots even withering up. We do not know the price of the solution, but believe it is very cheap.

An arsenical solution may be prepared by dissolving 4 lb. of caustic soda in a few gallons of water, and adding 8 lb. of arsenic. Boil until all is dissolved; add about 1 gallon of tar; boil again, and make up to 100 gallons with water.

2. Any arsenical spray, even if very weak, will kill off couch grass, which, however, will recover and grow again after a few months. The solution should not be used on the cultivation ground or flower beds, as it will infallibly destroy all vegetation, and our experience with Mr. Pickburn's solution is that nothing will grow for months after application on the soil which has been operated on.

SWELLING ON MARE'S HEAD.

YARRAMAN, Yandaran.—

Question.—A light harness mare for the past two years has had a slight swelling on the top of the head, just behind the ears, and about equally divided from the centre on each side downwards. It is hard, and does not appear to be painful or slightly so. For the past two weeks it has been gradually getting larger, still hard, and apparently painless. There is no appearance of sore place or wound. Information is requested how to treat.

Answer.—The question was referred to the Chief Veterinary Surgeon to the Department, and he advises:—"This growth cannot be removed except by a surgical operation requiring special skill and experience on the part of the operator. Unless the mare is a valuable one, and is required for show purposes, I would advise you not to operate, but to try the effect of a little of the following ointment rubbed into the swelling every fourteen days:—

Biniodide of mercury	...	...	...	1 dr.
Vaseline	...	...	...	3 oz."

FODDER GRASSES.

DAIRY FARMER, New Farm.—

1. The hilly country in the Coomera and Pimpama districts is well adapted for dairy farming. It is well-watered, grassed, and sheltered.

2. Kangaroo Grass (*Anthistiria ciliata*) enjoys an excellent reputation as a fodder grass. There are many forms of it, some deep-green, some shiny, others hairy, but all are equally good fodder. It must not be confused with *Andropogon refractus*, which is sometimes called Kangaroo Grass. This is abundant in Southern Queensland. It gives a large amount of fodder, but has a harsh stem, and can only be depended on for summer feed. The true Kangaroo Grass grows luxuriantly in some situations on "sour" grazing country. It is advisable to have a variety of grasses, with white clover as pasture.

3. Sugar-cane tops alone are not very nutritious as fodder. The usual method of using the cane as feedstuff is to chop it up and mix it with molasses. Some of the sorghums when fed to stock will produce worms, and sugar-cane is said to have a tendency to do the same, but not to such an extent as the sorghums.

OIL SEEDS AND BUCKWHEAT.

INQUIRER, Atherton.—

Some time ago Messrs. J. G. Cook and Co., Produce Markets, Prahran, were purchasers of sunflower seed at £14 per ton, and peanuts at £20 per ton. For buckwheat they offered £7 to £12 per ton. The above delivered in Melbourne.

WARTS ON COWS' TEATS—COWS ABORTING.

H. K. B., Bell.—

Mr. Sydney Dodd, Chief Veterinary Surgeon to the Department of Agriculture and Stock, says:—

1. Warts on the teat are most conveniently removed when the cow is dry. Those situated on the outside of the teat may be removed by tying a piece of thread or horse hair tightly round the base if the wart is long and narrow; this prevents the flow of blood to the wart, which eventually drops off. If the wart is short and broad, it should be lightly rubbed every few days with a piece of caustic silver or potash, or even strong nitric acid, care being taken that none of the surrounding flesh comes in contact with the caustic.

2. Your cows appear to be suffering from contagious abortion. For treatment and prevention see the "Queensland Agricultural Journal" for December, 1905, p. 249; June, 1907, p. 352; and May, 1908, page 271. In the Journal will also be found eight notices on "Warts on Cattle."

POST-HOLE DIGGER—CATTLE DIP.

"POST-HOLES," Mullet Creek.—We are not aware of a hand machine which may be relied upon to work in hard land, or where roots, stones, or other obstructions exist.

Two kinds have been tried and discarded. They worked where the soil was a nice deep alluvial, and in a sandy loam; but the hole made was much too small for the ordinary run of substantial split-posts.

The usual selling price is from 5s. to 6s., but Brisbane firms do not carry any stock now. See description and illustration of such an implement in this issue.

CATTLE DIP.

No better dip can be erected than from one of the plans illustrated in the pamphlet issued by the Department; they are based on the experience of the departmental officers, and, while small details may be varied, the general plan would be followed with advantage; for a herd of twenty cows, 10 ft. in length in the bottom may do, and the yards may be reduced in proportion; the clay soil would be more reliable for holding than sand, and the latter would cost about 2s. 2d. less for excavation than the clay. If timber were used, then the clay excavated could be used for puddling, and the cost reduced proportionately.

CREAM TESTS.

CREAM SUPPLIER, Gladstone.—

"Cream Supplier" asks which of the two following cream tests is correct. The tests are from two separate factories:—

No. 1 TEST.			No. 1 TEST.		
Cream.	Test.	Butter Fat.	Cream.	Test.	Butter Fat.
Lb. 63	37	27	Lb. 63	37	28·03
No. 2 TEST.			No. 2 TEST.		
51	38	22	51	38	23·30

Answer.—Your question has been referred to Mr. R. Winks, senior grading officer to this Department. His decision is as follows:—

“Your correspondent is evidently confusing the butter-fat content of each lot of cream with the amounts of commercial butter produced. The amount of butter fat in 63 lb. cream, testing 37 per cent., is 23·31 lb.; and that from 51 lb. cream, testing 38 per cent., is 19·38 lb. butter fat. The difference in the amounts given by each factory is accounted for by the amount of over-run allowed in each case—*i.e.*, the difference between the quantity of butter fat in a given quantity of cream, and the amount of butter it should produce. In the one instance about 15 per cent. and the other 20 per cent. over-run is allowed. The probabilities are that the former is the more correct of the two, as a 20 per cent. over-run is altogether too high, and would point to either inaccuracy in the testing of the cream or carelessness in the manufacture of the butter. Most Queensland butter factories use Mr. O’Callaghan’s chart.”

Times of Sunrise and Sunset at Brisbane, 1908.

DATE.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON.	
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.		H. M.
1	6·3	5·34	5·29	5·47	4·58	6·5	4·46	6·28	4 Sept. ☾ First Quarter	6 51 a.m.
2	6·2	5·34	5·28	5·48	4·57	6·6	4·46	6·29	10 „ ○ Full Moon	10 23 p.m.
3	6·1	5·35	5·27	5·48	4·57	6·7	4·46	6·29	17 „ ☾ Last Quarter	8 33 „
4	5·59	5·35	5·25	5·49	4·56	6·8	4·46	6·30	26 „ ● New Moon	0 59 a.m.
5	5·58	5·35	5·24	5·49	4·55	6·8	4·46	6·31		
6	5·57	5·36	5·23	5·50	4·55	6·9	4·46	6·32		
7	5·56	5·36	5·22	5·50	4·54	6·10	4·46	6·32		
8	5·55	5·37	5·21	5·51	4·53	6·10	4·46	6·33	3 Oct. ☾ First Quarter	4 14 p.m.
9	5·54	5·37	5·20	5·51	4·53	6·11	4·46	6·34	10 „ ○ Full Moon	7 3 a.m.
10	5·53	5·38	5·19	5·52	4·52	6·12	4·47	6·35	17 „ ☾ Last Quarter	1 35 p.m.
11	5·52	5·38	5·18	5·52	4·52	6·13	4·47	6·35	25 „ ● New Moon	4 47 „
12	5·51	5·39	5·17	5·53	4·51	6·13	4·47	6·36		
13	5·49	5·39	5·16	5·54	4·51	6·14	4·47	6·36		
14	5·48	5·39	5·15	5·54	4·50	6·15	4·48	6·37		
15	5·47	5·40	5·13	5·55	4·50	6·16	4·48	6·38	2 Nov. ☾ First Quarter	0 16 a.m.
16	5·46	5·40	5·12	5·55	4·49	6·16	4·48	6·38	8 „ ○ Full Moon	5 58 p.m.
17	5·45	5·41	5·11	5·56	4·48	6·17	4·49	6·39	16 „ ☾ Last Quarter	9 41 a.m.
18	5·43	5·41	5·10	5·56	4·48	6·18	4·49	6·40	24 „ ● New Moon	7 53 „
19	5·42	5·42	5·9	5·57	4·48	6·19	4·49	6·40		
20	5·41	5·42	5·9	5·58	4·48	6·20	4·50	6·41		
21	5·40	5·43	5·8	5·58	4·47	6·20	4·50	6·41		
22	5·39	5·43	5·7	5·59	4·47	6·21	4·51	6·42	1 Dec. ☾ First Quarter	7 44 a.m.
23	5·38	5·44	5·6	5·59	4·47	6·22	4·51	6·42	8 „ ○ Full Moon	7 44 „
24	5·37	5·44	5·5	6·0	4·47	6·23	4·52	6·43	16 „ ☾ Last Quarter	7 12 „
25	5·35	5·44	5·4	6·1	4·46	6·23	4·53	6·43	23 „ ● New Moon	9 50 p.m.
26	5·34	5·45	5·3	6·1	4·46	6·24	4·53	6·44	30 „ ☾ First Quarter	3 40 „
27	5·33	5·45	5·2	6·2	4·46	6·25	4·54	6·44		
28	5·32	5·46	5·1	6·3	4·46	6·26	4·54	6·44		
29	5·31	5·46	5·1	6·3	4·46	6·26	4·55	6·45		
30	5·30	5·47	5·0	6·4	4·46	6·27	4·55	6·45		
31	...	...	4·59	6·5	...	...	4·56	6·46		

The Markets.

PRICES FOR FRUIT—ROMA-STREET MARKETS.

Article.	SEPTEMBER,	
	Prices.	
Apples, per case	...	
Apples (Hobart), per case	9s. to 13s.	
Apples (American), per case	13s. 6d.	
Apricots, Local, per packer	...	
Asparagus (Westbrook State Farm), per dozen bundles	...	
Bananas (Queensland), per dozen	2d. to 3d.	
Custard Apples, per case	...	
Gooseberries, per quarter-case	...	
Lemons, per case	9s. to 12s.	
Lemons, rough, per case	...	
Loquats (Sydney), per case	6s. to 6s. 6d.	
Mandarins, per case	7s. to 9s.	
Mangoes, per case	5s. to 8s.	
Oranges, Queensland, per case	5s. 6d. to 7s. 6d.	
Passion Fruit (Sydney), per case	...	
Papaw Apples, per quarter-case	...	
Persimmons, per case	...	
Pineapples, rough, per dozen	1s. to 4s.	
Pineapples (Ripley's), per dozen	...	
Pineapples, smooth, per dozen	3s. to 8s.	
Rosellas, per sugar bag	...	
Strawberries, per dozen cardboard boxes	4s. 6d. to 5s. 6d.	
Tomatoes (small), per quarter-case	3s. to 8s.	
Tomatoes (spotted), per quarter-case	4s.	
Tomatoes (prime), per quarter-case	5s. to 7s. 9d.	

SOUTHERN FRUIT MARKET.

Apples (Hobart) per case	5s. to 12s.
Apples, American, per case	12s. to 15s.
Apples, Tasmanian, per case	12s.
Bananas, Fiji, Gros Michael, per case	18s.
Bananas, Fiji, sorts, per case	24s.
Bananas, Fiji, ordinary, per case	15s. 6d. to 16s.
Bananas, Fiji, per bunch	3s. to 7s. 6d.
Bananas, Queensland, per case	12s. to 13s.
Bananas, Queensland, per bunch	4s. to 5s. 6d.
Chillies, per bushel	...
Lemons (Lisbon), per case	— to 10s.
Loquats (Sydney), per case	— to 5s.
Mandarins (Local), per case	18s.
Mandarins, Emperor, per case	...
Oranges, Queensland, per case	12s.
Oranges, Queensland, Navel, per case	15s.
Passion Fruit (Sydney), choice per case	6s. to 7s.
Passion Fruit (medium), per case	3s. 6d. to 4s. 6d.
Passion Fruit (small), per case	1s. 6d. to 2s.
Pears, Victorian, per case	...
Pears, Tasmanian, per half-bushel case	...
Pineapples (common), choice, per case	8s. to 10s.
Pineapples (medium), per case	6s.
Pineapples (Ripley Queens), per case	8s. to 10s.
Strawberries, Queensland (choice), per three-quart tray	6s. to 7s.
Strawberries (medium), per three-quart tray	2s. to 3s.
Strawberries (small and inferior), per three-quart tray	1s.
Tomatoes, Queensland, choice (coloured), per quarter-case	6s. to 7s.
Tomatoes, good, per quarter-case	4s. to 5s.
Tomatoes, small	Unsaleable.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR OCTOBER.

Article.							OCTOBER,
							Prices.
Bacon, Pineapple...	...	...	...	...	...	lb.	8½d. to 10d.
Barley, Malting	...	...	...	...	...	"	...
Bran	...	...	...	...	...	ton	£7 to £7 5s.
Butter, Factory	...	...	...	...	...	lb.	1s. 2d.
Chaff, Mixed	...	...	...	...	...	ton	£5 10s.
Chaff, Oaten	...	...	...	...	...	"	£6 10s. to £8 10s.
Chaff, Lucerne	...	...	...	...	...	"	£5 to £6 10s.
Chaff, Wheaten	...	...	...	...	...	"	£3 to £4
Cheese	...	...	...	...	...	lb.	8½d. to 9d.
Flour	...	...	...	...	...	ton	£9 15s. to £10
Hay, Oaten	...	...	...	...	...	"	£9
Hay, Lucerne	...	...	...	...	...	"	£5 to £5 10s.
Honey	...	...	...	...	...	lb.	2¼d. to 2¾d.
Maize	...	...	...	...	...	bush.	4s. 4d. to 4s. 5d.
Oats	...	...	...	...	...	"	3s. 8d. to 4s.
Pollard	...	...	...	...	...	ton	£7 5s.
Potatoes	...	...	...	...	...	"	£6 15s. to £15
Potatoes, Sweet	...	...	...	...	...	"	...
Pumpkins	...	...	...	...	...	"	...
Wheat, Milling	...	...	...	...	...	bush.	4s. 11d.
Wheat, Chick	...	...	...	...	...	"	4s. 11d.
Onions	...	...	...	...	...	ton	£15 to £18
Hams	...	...	...	...	...	lb.	10d. to 1s. 0½d.
Eggs	...	...	...	...	...	doz.	7½d. to 8¾d.
Fowls	...	...	...	...	...	pair	3s. 4d. to 4s. 11d.
Geese	...	...	...	...	...	"	6s. 3d. to 6s. 6d.
Ducks, English	...	...	...	...	...	"	3s. 7d. to 4s.
Ducks, Muscovy	...	...	...	...	...	"	4s. 10d. to 5s. 6d.
Turkeys (Hens)	...	...	...	...	...	"	7s. to 8s.
Turkeys (Gobblers)	...	...	...	...	...	"	15s. to 18s.

ENOGGERA SALEYARDS.

Animal.							SEPTEMBER.
							Prices.
Bullocks	...	...	...	...	...	...	£10 10s. to £12 12s. 6d.
Cows	...	...	...	...	...	...	£8 17s. 6d. to £10 2s. 6d.
Merino Wethers (woolly)	...	...	...	...	...	...	25s. 9d.
C.B.	...	...	...	...	...	...	18s. 6d.
Merino Ewes	...	...	...	...	...	...	21s. 9d.
C.B.	...	...	...	...	...	...	17s. 9d.
Lambs	...	...	...	...	...	...	18s.
Pigs (Porkers)	...	...	...	...	...	...	32s.

Farm and Garden Notes for December.

FIELD.—The grain harvest will now be nearing completion, and although the results are not likely to constitute a record it will in all probability turn out to be very satisfactory to the wheat-growers. The principal factor operating against an increased yield is that many farmers who formerly grew wheat and barley have turned their attention to dairying, which offers larger and quicker returns.

The dry weather which prevailed during the months of August and September gave rise to grave fears for the harvest, but the subsequent timely rainfall came just in time to save the crop. The estimates of the probable yield have varied so considerably that it will be well to wait until the harvest is over before calculating on the result.

Given favourable weather, maize, panicum, imphee, Kafir corn, and sorghum may be sown. Arrowroot, ginger, and sweet potatoes may be planted.

KITCHEN GARDEN.—Gather cucumbers, melons, vegetable marrows, and French beans as soon as they are fit for use. Even if they are not required, still they should be gathered, otherwise the plants will leave off bearing. Seeds of all these may still be sown for a succession. Tomatoes should be in full bearing, and the plants should be securely trained on trellises or stakes. Take up onions, and spread them out thinly on the barn floor until the tops wither sufficiently to pull off easily. They should then be graded into sizes, and sent to market or stored in a cool place. Where there is an unlimited supply of water, and where shade can be provided, lettuce and other salad plants may still be sown.

FLOWER GARDEN.—Keep the surface of the land well stirred. Do not always stir to the same depth, otherwise you are liable to form a "hard pan" or caked surface beneath the loose soil. Alternate light with deep hoeings. A few annuals may still be planted, such as balsams, calendulas, cosmos, coreopsis, marigold, nasturtium, portulacca, zinnia, and cockscomb. Plant out whatever amaranthus may be ready. These may still be sown in boxes. Clear away all annuals which have done flowering. Bulbs should have all the dead leaves cut away, but the green leaves should not be touched. Stake chrysanthemums, and as the flower buds develop give them weak liquid manure. Coleus may now be planted and propagated from cuttings. Dahlias are in various stages, but the greater part will have been planted by this time. Give them liquid manure, and never let them dry up. Lift narcissus about the end of the year, but do not store them. Plant them out at once in their new positions. Top dress all lawns.

Orchard Notes for December.

By ALBERT H. BENSON, M.R.A.C.

THE SOUTHERN COAST DISTRICTS.

December is somewhat of an off month for pines, though bananas should be improving both in quality and quantity. The purely tropical summer-ripening fruits are not yet ready, and, consequently, there is only a limited supply of fruit in this part of Queensland during the month.

Early ripening varieties of grapes will mature, and care should be taken to market them in good order. The first fruit to ripen should be put up in small packages, as, if marketed in this manner, it will fetch a better price; but as it becomes more plentiful it can be packed in larger cases.

Pay particular attention during the month to all peaches, apples, pears, Japanese plums, or other fruits that are liable to be attacked by fruit fly, and see that no fly-infested fruits are allowed to lie about under the trees, and thus breed out a great crop of flies that will be ready to destroy the grape and mango crops as they mature.

If the month is dry, see that the orchard is kept well worked so as to retain moisture in the soil, and, in any case, even should there be a good rainfall, it is necessary to cultivate in order to keep down weed growth, as if weeds are not kept in check now there is little chance of their being kept in hand once the January and February rains set in.

The planting out of pineapples, bananas, and most kinds of tropical fruits can be carried out during the month, especially if there is any rainy weather; but, if the weather is dry, it is better to defer the planting of tropical fruits till January or February.

The cyaniding of citrus trees can be continued where necessary, and where Maori or orange mite is showing it should be checked at once, as Maori fruit is of no use for the Southern markets, and is unsuitable for export to the old country.

THE TROPICAL FRUIT DISTRICTS.

Clean up all orchards, pineapple, and banana plantations as long as you have the chance of fine weather, so as to have your land in good order when the wet season commences, as once the rain sets in there is little chance of fighting weeds. Watch bananas carefully for fly, and market the fruit in good order. Handle the crop of pines carefully; don't let the fruit get too ripe, as an over-ripe Northern pine is tasteless. The fruit should be cut as soon as it is fully grown, as even when quite green the rough-leaved varieties have usually developed sufficient sugar to suit most persons' taste. Pack carefully to prevent bruising, and they will carry South in good order.

Only send high-class mangoes South; bad flavoured sorts and stringy, caroty, or turpentine-flavoured varieties are not worth shipping. High-class fruit will pay to handle carefully, but there is no demand for rubbish, and I am sorry to say that fully 90 per cent. of the mangoes grown in the State must be classed under the latter heading.

Tropical fruits of all kinds can be set out during suitable weather. Fruit pests of all sorts must be systematically fought.

THE SOUTHERN AND CENTRAL TABLELANDS.

December is a busy month for the growers in the Stanthorpe district. Early apples, plums, peaches, nectarines, &c., will ripen during the month, and must be marketed as soon as ripe, as they do not keep long once they are gathered. Handle carefully and grade better. There is far too much early rubbish slumped on to the local markets, which tends to spoil the demand as well as the price. Watch the orchards very carefully for codling moth and fruit fly, and take every possible precaution to keep these pests in check should they make their appearance, as the future cleanliness of the orchard depends very largely on the care that is taken now to keep these pests in check.

If the month is dry, keep the orchard and vineyard well cultivated. Watch the vines carefully so as to detect the first signs of oidium or anthracnose, and systematically fight these pests, remembering always that in this case prevention is better than cure, and that only prompt action is of the slightest value.

On the Darling Downs every care must be taken to keep the fruit fly in check, and on no account must infested fruit be allowed to lie about under the trees, as this is far and away the best method of propagating the pest wholesale.

In the Central District the grape crop will ripen during the month. Handle the fruit carefully. Cut it when dry, and where it has to be sent long distances to market pack in 6-lb. baskets rather than in larger cases. When dry keep the orchard and vineyard well cultivated, and when the citrus and other fruit trees require it give them an irrigation. Don't irrigate grapes once the seeds have been formed, as it tends to deteriorate the quality, and to make the fruit tender, and consequently to carry badly.

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NOTICE.

Queensland Agricultural Journal.

It is hereby notified that the *Journal* will be supplied to all members of Agricultural and Horticultural Societies who do not derive their livelihood solely from the land, on payment, in advance, of an annual subscription of 5s., which will include postage. Schools of Arts will be supplied at the same rate.

Persons resident in Queensland whose main source of income is from Agricultural, Pastoral, or Horticultural pursuits, which fact should be stated on the attached Order Form, will receive the *Journal* free

ON PRE-PAYMENT OF 1s. PER ANNUM,
to cover postage.

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Agriculture.

SILOS.

By H. C. QUODLING, Agricultural Inspector.

The class of silo referred to as "Portable and Non-Corrosive" has been put on the market by J. H. Holloway and Co., of Cromwell Buildings, Melbourne.

It is a patent steel-framed silo, with vertical sections from 9 to 12 ft. by 6 ft. in width; these are bolted together vertically and horizontally, and joints are lapped and packed. The studding is of angle steel, bolted at either end to angle-steel arcs. The inside sheeting is of 24-gauge galvanised iron, which is protected with an acid-proof mixture. Fencing wire is used to twitch round silo at intervals of a foot, to assist in withstanding pressure. The net cash prices, f.o.b. Brisbane, without roof, for silos up to 68 tons capacity, reckoned as for heavy silage, are as follow:—

(SILOS ARE SUPPLIED UP TO 150 TONS CAPACITY.)

Capacity—Tons.	Sections.	Height in Feet.	Diameter in Feet.	Weight in Cwt.	Without Roof.	Elevators.
					£ s.	£ s.
12	5	9	9	8½	25 10	7 15
24	{ 5-9' } 10	18	9	12½	39 10	10 15
28	6-12'	12	11' 9"	10	36 10	8 15
50	9-12'	12	16' 9"	15	47 10	8 15
53	{ 6-12' } 12	21	12	18	50 0	10 15
	{ 6-9' }					
55	{ 7-9' } 14	18	13	20	52 0	10 15
	{ 7-9' }					
61	{ 7-12' } 14	21	13	21	57 0	10 15
	{ 7-9' }					
68	{ 6-9' } 18	27	12	25	61 10	12 15
	{ 6-9' }					

Different classes of silos have been erected at the Queensland Agricultural College and the State Farms, to determine which class is likely to prove the most durable and economical for the farmer.

Briefly, the kinds in use are—

Rectangular Overground Silo (with fixed gable-ended roof).—Frame of silo is of 6 in. by 2 in. hardwood studding, lined horizontally and vertically with 6 in. by 1 in. tongued and grooved hardwood, the tongues and grooves being treated with hot tar or other bituminous solution before cramping up, followed by two coats of the same material, ports being left at convenient intervals.

Rectangular Overground Silo (with movable roof, to roll off).—Framework is similar to one previously mentioned, but corner posts are rabbited to receive 6 in. by 1½ in. tongued and grooved lining, treated as before, and then lined with 2-ply malthoid.

Fibro-cement Silo (120 tons capacity, 24 ft. high).—This kind is built of stout timber; octagonal-shaped framework, with hardwood battens checked in flush to form a backing for sheets of fibro-cement, with which building is lined. The frame is stayed by means of bolts placed at intervals where sections meet, and the whole building is clamped securely together by means of three iron rods passed around it at regular intervals. The joints formed where the sheets of fibro-cement meet, are pointed up to make air-tight with a cement mastic.

Circular Silos, of 60 tons capacity, timber studding, lined with 24-gauge galvanised iron, and protected with an acid-proof paint and a limewash when filling. (This is the type erected by the Victorian Government.)

Circular Silos, of 60 and 100 tons capacity, timber studding, and lined horizontally with 4 in. by $\frac{5}{8}$ in. shot-edged hardwood, to which an inner lining of 2-ply malthoid is attached.

Pit Silos, made by excavating in soil and rock underneath the roof of a hay shed, also makeshift silos made by excavating a deep trench with a plough and scoop, and afterwards using the soil removed from it for weighting material, and as a means, when rounded off, for keeping contents dry.

It has been ascertained by practical test that silos lined with galvanised iron, even when protected with an acid-proof paint and whitewashed, are likely to corrode should the silage be of a very succulent nature—as sorghums—and have to remain in the silo for any lengthened period, say, eighteen months at a stretch.

They may be filled with a crop which is not too juicy, as barley and other cereals, and emptied, say, in a few months, without any apparent change taking place in the galvanised iron.

As far as strength of construction goes, the circular, timber-lined silo is to be commended, but, so far, the inner and necessary air-tight lining of malthoid has not proved to be as good an acid-resister as it is claimed to be by the vendors.

Fibro-cement as a lining is somewhat brittle and easily damaged, but the manufacturers are putting a thicker sheeting on the market, to overcome this defect. Good silage has been made in this class of silo, with a minimum of waste at the sides.

The plain timber sheeting on rectangular silos acts for several seasons, but requires to be kept well protected, to save the absorption of juices which would rot it.

The tests which the galvanised iron lined silos have been put to have proved conclusively that it will be a fallacy to depend upon this class of lining to last any definite time. Steps have been taken to adopt a permanent lining, by simply using the galvanised iron as a background for a cow-hair and concrete plaster, 1 in. in thickness, applied to wire netting. The netting is previously attached to studs in the framework of building by means of staples, and forms a reinforcement for the plaster and a handy means of binding it.

With regard to the best type of silo to adopt, a decision has been arrived at to erect permanent structures of reinforced concrete. The material for reinforcement is Johnson's steel wire lattice, and consists of parallel wires about 3 in. apart, with vertical wires at regular intervals. The lattice may be had in any lengths and of any wire gauge.

Moulds to suit the circumference of the silo to be erected are made, and the wire lattice is embedded in the concrete used to fill them. Plans have been prepared for three silos, and next week a silo will be started at the Roma State Farm.

The cost of erection cannot be stated as yet, but once the moulds are made, which may be used for an indefinite number of silos of the same size, it is calculated the cost will amount to about £1 per ton capacity. The building, when complete, will be of a permanent character, unaffected by the weather or the corrosive action of the silage juices.

Department of Agriculture and Stock,
Brisbane, 15th October, 1908.

DRY FARMING IN SEMI-ARID DISTRICTS.

By W. FRANK McCLURE.

A great deal of attention is being attracted at this time to a system of agriculture known as "dry farming," which is being successfully used in the semi-arid districts of Colorado and other Western States in place of extensive schemes of irrigation. By "semi-arid" is meant a territory in which the annual rainfall is less than 20 and more than 8 in. By dry farming, many thousands of acres which, on account of their location, could never be reached by irrigation ditches, are reclaimed. Some of this acreage has long been styled "grazing lands," and considered useful for nothing else.

"Dry farming," briefly stated, consists in so preparing the soil in semi-arid regions that it will catch what little annual rainfall there is, and store it within reach of the roots of the plants to be grown. This, as might be supposed, requires a firm, solid foundation beneath the soil. The soil above is kept firm and loose, and acts as a mulch, keeping the moisture from escaping into the atmosphere, much as a brick or plank keeps the ground directly under it moist even in a beating sun. With such preparation of the soil, grazing lands will often yield as high as 40 to 50 bushels of wheat to the acre, or more than the yield of the Eastern States, where the natural rainfall is adequate.

The last two years have witnessed the greatest progress in the new plan of reclamation. Not only is "dry farming" being extensively employed in Colorado, Kansas, and Nebraska, where it was first introduced, but in eastern Washington, Oregon, Wyoming, Idaho, and Utah, where heretofore great tracts of prairie land could, in many instances, be bought as low as 50 cents an acre.

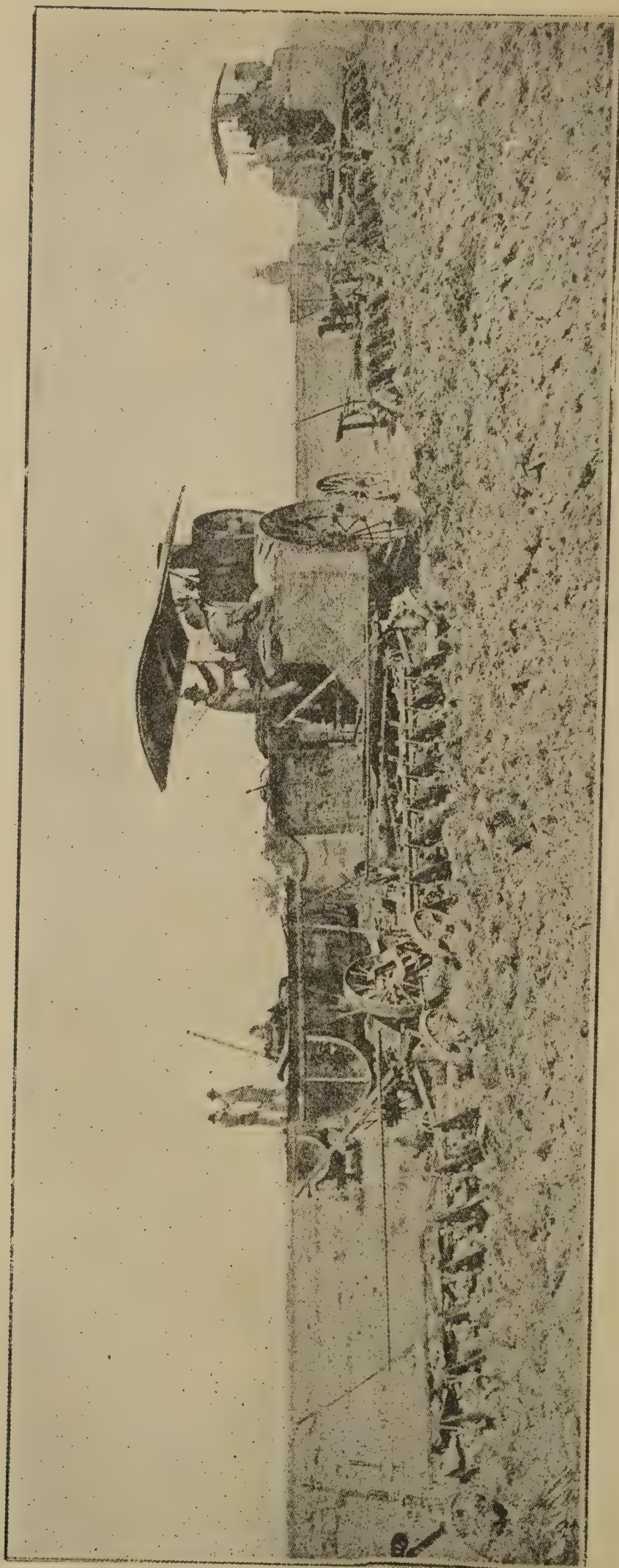
The first experiments in this line date back more than a decade. The founder of the method is Prof. H. W. Campbell, of Nebraska, under whose personal direction to-day are some large model farms in the West, illustrating the marvellous accomplishments of "dry farming." Five years ago the Department of Agriculture began to lend its assistance in the matter, carrying on investigations as to the localities in which "dry farming" will bring the best results. The department is also searching in many parts of the world for kinds of alfalfa and wheat and other plants which will yield the largest returns with a rainfall of less than 20 in.

As to land, it may be stated that high plateaux or rolling hills afford a better supply of rain to be stored by "dry farming" methods than do the valleys, and they are, therefore, usually chosen first.

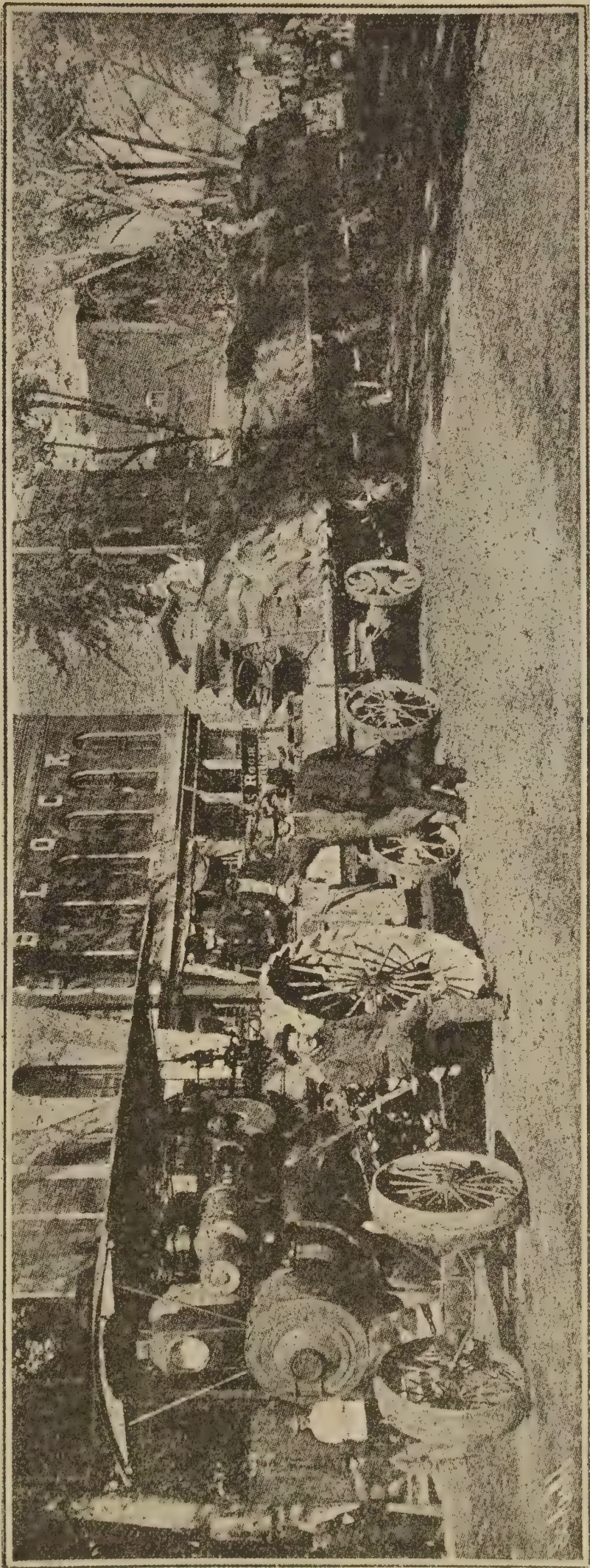
The accompanying photographs were made at Longmont, Colorado, where many thousands of acres are under cultivation. This State is taking particular interest in development along these lines. Within the past year Gov. McDonald called together a congress of "dry farmers." Many ranches are being broken up to give place to the new system of farming, for it does not pay to raise cattle at the present prices at which this land is selling. In fact, much of the upland country is being turned into a veritable garden.

The first operation in the preparation of the soil is ploughing. This must be deep. A disc or a mould-board plough may be used, depending on the character of the ground. One object of the deep ploughing is to provide an adequate reservoir for the storage of the rainfall. Gang ploughs, with twelve to sixteen ploughshares in each, are a common sight. These ploughs are drawn by traction engines, as shown in the photograph.

Steam ploughing helps out wonderfully in this work. In some of the Western States it would be out of the question to secure sufficient men and teams to accomplish the ploughing of the hundreds of thousands of acres annually being reclaimed by "dry farming." Steam ploughing costs less than half as much as ploughing with teams. It is not unusual for one ploughing outfit to turn 3,000 acres of sod into cultivated land in one season. Two men are needed to operate the engine, besides a teamster and team for hauling fuel.

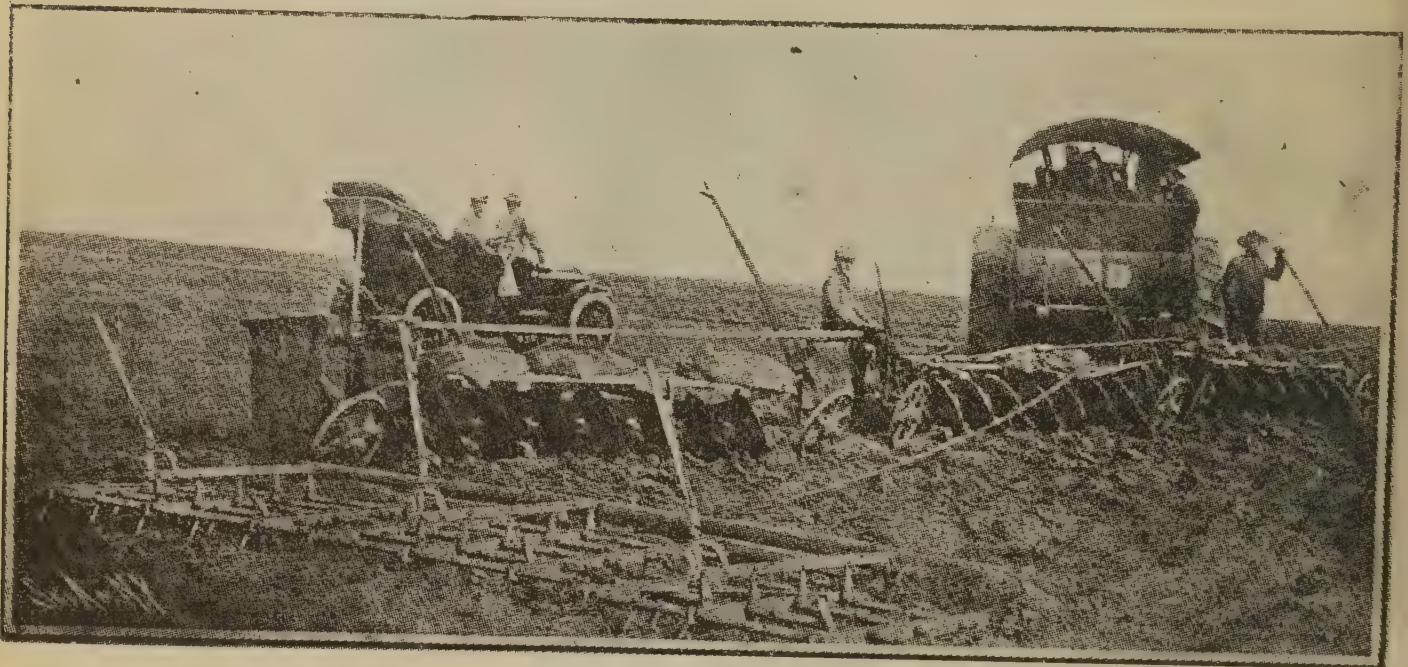


BREAKING THE GROUND FOR DRY FARMING.



DRY FARMING IN ARID DISTRICTS.—HAULING GRAIN TO MARKET IN COLORADO.

A sub-surface packer follows the plough, drawn by the same traction engine as the plough. This packer is similar in shape to a disc plough, except that it has ten wheels. These wedge-shaped wheels or discs are 18 in. in diameter, and are arranged vertically on a shaft 6 in. apart. The object of the sub-surface packer is to firm the soil. A smooth roller, if used for this purpose, would have the effect of packing the surface soil rather than that of the sub-surface. The wheels of the packer, however, are so arranged that they firm the soil in the lower portions of the furrow, restoring capillarity where ploughing has arrested it. A smoothing harrow next follows, leaving a pulverised layer on top, which prevents the moisture from below from reaching the surface and evaporating.



THE SMOOTHING HARROW FOLLOWING THE PLOUGH.

The constant care and working of the soil on which the crops are to be raised are said to be equally important with the rainfall itself. The pulverised ground must not be allowed to pack or break in any event. To avoid this, the harrow is run over it after each rain. The working of the soil begins several months before seeding, and must also be continued after seeding.

A great many people, cultivating their land under the new system, aim to raise but one crop from the same ground in two years. They divide this land into two equal parts, and use one part for crops one year, and the other the next. This admits of what is known as "summer culture" on the part not in use, and the storing of a season's rains in the soil reservoir. Again, it may be feasible to allow the land to produce crops for two years, and alternate one year of "summer culture." Where crops are planted every year, ploughing must quickly follow the operation of harvesting, the aim being to save all possible moisture in the ground and simultaneously prepare the soil for the next rains.

It is confidently expected that the time will come, when land on which but a 10-in. rainfall is now recorded, will be made to blossom as the rose. This will be accomplished by further advances in scientific discovery. At present, districts having less than 14 in. rainfall are not regarded as profitable. An educational movement for the scientific study of "dry farming" has already been talked of. Not all attempts at "dry farming" are a success, nor will be, until the mass of the people using it understand the principles on which it must be carried out. The rainfall varies in different years, and this emergency must be met in a scientific way. Conditions differ also in different localities.

The establishment of more Government experiment stations will greatly assist different sections. Several are to be established, it is understood, this year. At Cheyenne, Wyoming, the Board of Trade not long ago established an experiment station, assisted by the Government and the railroads. It was here found that, although Cheyenne is at an elevation of 6,000 ft. above sea level, wheat, rye, barley, oats, alfalfa, field peas, and sugar beets can be grown profitably. As a result of the experiments, the ranchmen in Wyoming are buying thousands of dollars' worth of farming machinery, and are breaking up large acreages and sowing alfalfa and other grasses and grains. Ranches are also being sold for colonisation purposes.—“Scientific American.”

JERUSALEM MAIZE.

We have, on several occasions, been asked for the seed of the Jerusalem maize, but none appears to be obtainable in Queensland, although in 1898 seed was obtained by the Department of Agriculture and Stock, and distributed to several farmers at Park Ridge, Redland Bay, Swan Creek, Warwick, Pittsworth, Wallumbilla, and Waterford.

We have just received a Bulletin (No. 1, April, 1906) on this cereal, issued by the Secretary for Agriculture, Chihuahua, Mexico, from which we extract the following information:—

“Jerusalem maize is a plant which should be propagated in Mexico, especially in regions where there is a small rainfall, because it is one of the few plants capable of producing a remunerative crop where maize and wheat perish for want of rain. Its capacity for resisting drought, which has on many occasions been proved, does not justify, however, the belief that it will yield a crop in any region wheresoever, where maize cannot be cultivated for want of water.

“We must look upon the plant merely as more resistant than maize, but not as a marvellous plant capable of yielding a crop in places where vegetation is impossible. In the arid regions of California it is sown in order to obtain a second crop, when there is no probability of obtaining one with ordinary maize.

“For several years this plant has been grown in Ciudad Juarez, and, seeing that, whether it is used as a fodder plant or because of some inevitable law which presents difficulties at the beginning of all business, or of all agricultural operations which effect their ruin, the fact remains that the results do not indicate that it concerns an unimportant article of cultivation for ourselves.”

The Bulletin alluding to experiments with Jerusalem maize says further:—

“The first sowing was made on 5th May, 1905, and the second on 20th June.

“The isolated sowing proved the precocity of the plant, which recommends it very much as a forage plant for cutting in a green state.

“We are equally convinced of its hardiness, because we intentionally left a small piece of ground without weeding, on a clayey soil, and without giving it the benefit of any labour, except ordinary irrigation, yet, notwithstanding this intentional neglect of care, the seed matured well, producing, however, as is natural, ears of less size than those of the plants on cultivated plots.

“The cultivation of these two plots places us in a position to institute comparisons with other crops which grew in contiguous fields.

“We are alluding to a field where already a crop of green barley fodder had been raised, which was sown on 24th December of the previous year, so that the soil had already yielded a crop after that year.

“The fields of Jerusalem maize thrived to perfection, and, according to observations made, it may be authoritatively stated that this plant is more

resistant to dry conditions than ordinary maize; and, furthermore, its qualities, which were generally recognised, are confirmed by experiments made in the United States.

"When the plant flowers, the ear inclines downwards in consequence of the weight of the grain, probably the result of heredity, as does the Egyptian Dourrha, which is another variety of heavily-seeding sorghum, and in the distinctive manner of the sugar sorghum, broom millet, and the common forage sorghum.

"After the flowering season, the ears of the Jerusalem maize appear perfectly formed, and inclined downwards, in consequence of the weight of the grain, which appears abundantly.

"On the land where the experiments were made in the cultivation of this plant, there appeared a black fungus (smut ?) amongst the maize, owing possibly to the peculiar climatic conditions, and here a curious phenomenon was observed: The ears of sweet cane or sugar sorghum suffered general contagion, producing blackened and ill-formed grains, 40 per cent. of the ears being thus damaged.

"In the fields *adjoining the Jerusalem maize*, not a single ear was found to be attacked, which proves that even under the conditions in which the experiments were made the Jerusalem maize was a plant immune to this disease. Without further experiments or more extended research, it would not be justifiable to generalise the affirmation that the disease does not attack this plant; yet there is already sufficient evidence to determine the above results concerning its resistance against the disease.

"Another singular phenomenon may be here noted, which tends to recommend Jerusalem maize as a field crop, of settled characteristics, well adapted to our climate and soil. In the sweet sorghum, whose seed (var. Early Amber), as is well known, is covered with black glumes, a hybridisation, very nearly general, which results in its ears producing a much more voluminous grain than the pure plant, grain which, owing to its size and shape, surpasses the original, a trait inherited by Jerusalem maize, the colour of which is a mixture of the black of the sweet sorghum and the pure white of the other seed.

"It is difficult to distinguish the hybrid of the sugar-cane and the brown dourrha of Egypt, for in the change there is not a single ear of Jerusalem maize which degenerates or suffers by the crossing, and all the grain saved exhibits the same qualities as those of the seed sown—viz., weight, size, and white colour.

"Both ordinary maize and Jerusalem maize are harvested during the first week in September, as in the case of sweet sorghum and others, notwithstanding that moisture may have been wanting during the growing season, and one may notice the vigour with which the roots of the two varieties sprout again, and in a short time produce a profitable forage crop.

"The Jerusalem maize harvest may take place before the abovementioned time, but a characteristic attributed to it should be noted, and that is, the ramification of the stems producing numerous ears, once each cane has produced the first ear. In effect, the product, notwithstanding its more reduced size, as compared with the first ears, will be less, as might be expected.

"As a result of this observation, it may be affirmed that the Jerusalem maize may serve in this climate to profitably occupy land on which barley or oats have been grown for green forage, and result at an opportune time in an excellent crop of grain and more leaf than ordinary maize.

"By making the sowing earlier, and not on land which has been under barley, a crop of grain may be obtained with certainty, or at least one cut of green fodder.

"Probably the aftermath, after the second cutting, provided moisture is not wanting, and if no early frost occurs, may likewise be profitable.

"The cultivation is done just as in the case of ordinary maize, except that it is sown in drills, depositing the seed at less depth. Sowing may be made at the same time, whether a green crop or a grain crop is required; in the latter case, however, there will be little profit.

"When the Jerusalem maize has germinated, the weeds must be kept down as often as necessary—*i.e.*, scarifying must be done as often as necessary to kill the weeds and to keep the surface of the soil in good tilth. After irrigation or heavy rains, the soil becomes compact, and forms cracks, which cause rapid evaporation. Then the cultivator must be used, a weeder or a scarifier to break down the crust and produce a fine surface, which will retain the moisture in the soil.

"This work must not be too deep, because Jerusalem maize, like ordinary maize, produces superficial, lateral roots, the destruction of which will injure the plant. . . . The furrows must run north and south, except in such localities where the slope of the land demands other treatment. . . . According to the analysis made at the Experiment Station in California, Jerusalem maize contains:—

Water	...	...	...	...	11.89	per cent.
Ash	...	...	...	...	1.87	"
Protein	...	...	...	...	9.84	"
Fibre	...	...	...	...	1.51	"
Free nitrogen	...	...	...	...	71.16	"
Fat	...	...	...	...	3.73	"
						100.00 per cent."

BUNT, OR STINKING SMUT OF WHEAT.

Press Bulletin No. 28, issued by the University of Nebraska Agricultural Experiment Station, U.S.A., deals with Bunt, or Stinking Smut of Wheat, by F. D. Heald.

Wheat (says Mr. Heald) is affected by two different types of smut: The loose smut, which destroys the entire head, transforming it into a powdery mass of black spores; bunt, or stinking smut, which affects only the berry, the other parts of the head remaining practically normal. There are two different species of bunt prevalent, but both affect the wheat in the same way, and they can only be separated by a microscopic examination of the spores. Nearly all of the bunt reported has proved to be *Tilletia foetans*, the smooth-spored species, while *Tilletia tritici*, the rough-spored species, has been exceedingly rare.

PREVALENCE.

The bunt of wheat has been especially abundant in certain sections of the State during the past season. From the number and character of the inquiries received it is apparent that the true nature of the disease and the preventive measures that should be employed are not well known by the farmers and grain dealers of the State.

Bunt has affected not only varieties of spring wheat, but it has been very prevalent in a large portion of the State where winter wheat varieties are grown. Almost all of the samples received from south of the Platte River were of the Turkish Red variety, while the majority of samples from north of the Platte were spring wheat. Turkish Red wheat has generally been considered especially smut-resistant, but the reports indicate that it will be necessary to treat seed of this variety for prevention of smut as well as in the case of spring wheat varieties. No samples of smutted wheat have been obtained from the eastern part of the State, but it has probably been present in small quantity.

EXTENT OF INJURY.

In some cases the smut has caused only a slight loss, while in others the loss has been serious. One correspondent reports, "Much wheat was too badly smutted for milling purposes." Another correspondent reported a loss of 15 cents per bushel on sale price, without mentioning the added loss from reduction of yield.

SYMPTOMS.

Bunt, or stinking smut, is not as noticeable in the field as the forms of loose smut, since it does not completely destroy the head. Its presence in a field may be detected by the characteristic odour, by the deeper green of the affected heads, and generally by the fact that the glumes are more spreading than in normal heads. A closer examination will show in the place of the "normal" kernels the black smut "berries" of nearly the same shape covered with a thin membrane. A small smut-eating beetle is quite frequently present on the affected heads.

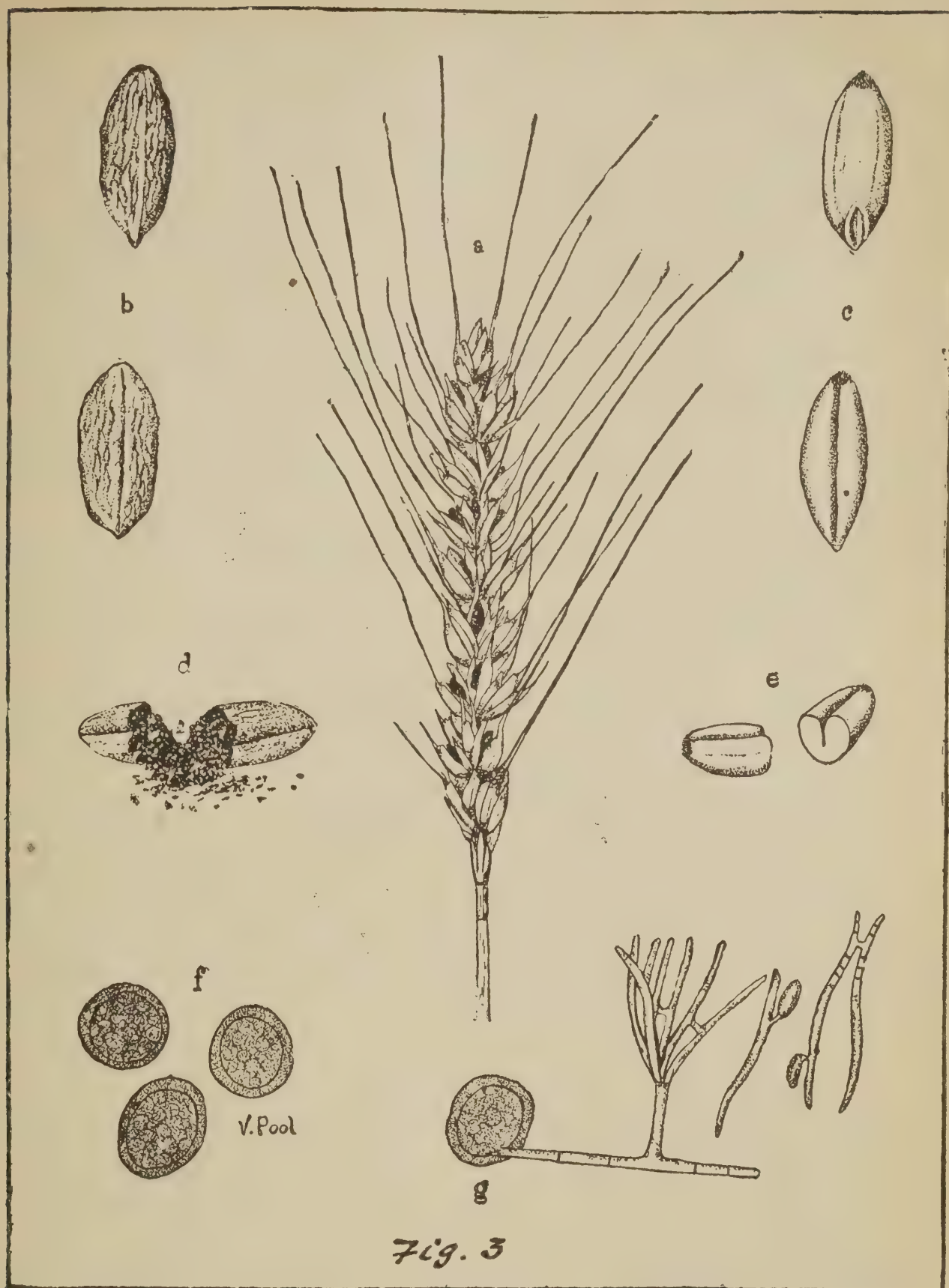
The smut may be very noticeable in the threshed grain or comparatively inconspicuous. In some cases the smut berries (Fig. 3, b) are entirely broken up and the black powdery mass of spores which they contain is scattered and lodged upon the surface of the normal grains. These spores collect particularly in the groove and in the tuft of hairs or "brush" at the tip of the grain. Badly-smutted wheat is frequently dark-coloured owing to the large number of spores collected upon the surface of the normal grains. When the smut berries are not broken they can easily be detected by their darker colour, their plumper form with the obliteration of the groove, and the fact that they can be easily crushed so as to exhibit the black powdery interior (Fig. 3, d).

LIFE HISTORY OF THE FUNGUS.

Every spore which finds lodgment upon the surface of a grain of wheat is capable of reproducing the disease, and it is from these spores that the infection of the young wheat plant takes place. For this reason any seed treatment which will kill the spores of the smut without injuring the vitality of the wheat will be effective. Under normal conditions, the smut spores germinate soon after the young wheat seedling has started to grow. The spore produces a short, septate filament which forms one or more tufts of H-shaped sporidia. These sporidia either give rise to secondary oval sporidia (Fig. 3, g) or produce infection threads direct which penetrate the tissues of the young seedling. After the smut fungus has gained an entrance into the seedling it grows upward through the tissues of the stem, but gives little external indication of its presence until the heads are produced, when it penetrates the berries or kernels and forms the characteristic smut "berries" which have been described. All of the heads produced by an infected stool are smutted, and generally all the berries of a smutted head are destroyed.

PREVENTION.

By seed treatment, the bunt of wheat and the smuts of oats can be almost entirely prevented, while the per cent. of smut in barley, sorghum, and rye can be very greatly lessened. While the hot-water treatment is effective, it is a rather laborious treatment to employ. The result is that it has been very largely superseded in this country by some of the chemical treatments. The principle of the chemical treatment is to use a poison which will kill the spores of the smut and not materially injure the germinating power of the seed. Out of many different chemicals tried up to this time, only a part has proven effective, such as potassium sulphide, corrosive sublimate, copper sulphate or bluestone, and formalin. During the past few years the use of formalin has very greatly increased, and the satisfactory results obtained justify its continued use.



Since the formalin steep is generally successful and easy to employ, it may be especially recommended. Formalin is a solution of formaldehyde, and the commercial article is 40 per cent. This strength is always understood in recommending the amount to be used in seed treatment.

The treatment of seed may be carried out as follows:—

1. Place the seed to be treated upon the clean floor of the granary, or upon a canvas in the open, or in some other suitable place.
2. Prepare the solution of formalin by adding the commercial article to water in the following proportions: 1 pint to 30 gallons for bunt of wheat or loose smut of oats; and 1 pint to 20 gallons for barley or sorghum smuts. This solution should not be made up until it is needed for use, as it loses strength by standing.

3. Sprinkle the formalin solution over the seed, and shovel it over until the surface of each grain is thoroughly moistened. For sprinkling the seed, a common gardening watering pot may be used to good advantage.
4. Shovel the grain into a heap and cover with a canvas or wet sacks to prevent the evaporation of the formalin.
5. At the end of two hours, uncover and spread the grain out to dry. It will probably be necessary to rake or shovel the grain over several times to dry sufficiently to prevent germination. If treated in the granary, the floor should be sterilised with formalin solution before beginning operations. If the grain is to be returned to the same bin which it occupied before treatment, the bin should be sprayed or washed with formalin solution to prevent any reinfection taking place. For the same reason infected sacks should be avoided or sterilised.

The formalin treatment may be carried out in a slightly different way, and some may prefer it to the method already outlined. The writer has found the following method very satisfactory:—

1. Prepare a solution of formalin of the strength indicated.
2. Put sufficient of the solution into a barrel to immerse a sack of seed (35 to 40 gallons).
3. Put seed to be treated into sacks ($1\frac{1}{2}$ to 2 bushels), and dip each sack into the solution, allowing it to remain ten minutes.
4. Remove the sack and drain, allowing the excess of the steep to run back into the barrel. The solution should be replenished as often as necessary. The dipping can be very easily carried out by arranging the barrel so that a block and tackle can be employed for raising and lowering the sacks.
5. Set away in the wet sacks for two hours, or empty in a heap and cover with canvas or wet sacks as in the previous treatment.
6. At the end of two hours spread out to dry, taking pains to shovel over often enough to prevent germination.

Seed treated by either of the methods mentioned may be sown as soon as dry, or it may be stored in any suitable place if care is taken to avoid any re-infection.

CABBAGE APHIS.

Complaint having been received of damage to growing cabbage by aphis in several parts of Southern Queensland, a report dealing with methods for subduing it, prepared by the Government Entomologist, Mr. Henry Tryon, is being issued by the Department of Agriculture and Stock. It reads as under:—

With regard to the means to be adopted for keeping aphis occurring upon cabbage in subjection, it may, prior to going into details, be pointed out, that its mode of feeding consists in piercing the plant tissue with its proboscis or snout—an hair-like organ—and therefrom extracting the sap, and that, accordingly, unlike an insect that feeds by gnawing away the substance of the foliage, it must be attacked by means of some preparation that kills by contact. Such insecticides as Paris green, lead arsenite, &c., are not, therefore, available for its destruction. But, being a soft-bodied insect, the death of the individual may be readily effected; several preparations, when used, securing this end. Amongst these the following may be mentioned:—

1. *Tobacco Tea*.—Made by pouring boiling water over tobacco at the rate of 1 lb. of the latter to 4 gallons (kerosene tin full) of the former. Any crude tobacco being applicable for the purpose, such as leaves from ordinary plants grown on the farm and dried, or stalks, a waste product from tobacco manufacture. Should a little

syrup (crude molasses) or soap be added to the decoction, this will promote adhesion, always difficult in the case of cabbage aphids, and the plants they feed upon, both being covered with a wax-like bloom that tends to shed any fluid directed upon them. Generally speaking, this tobacco infusion should be of a strength indicated by its being of the colour of the beverage—tea. (*Note*.—Formerly one of the local firms, Fenwick and Co., Brisbane, stocked a convenient extract of tobacco named Roseleaf, wherewith readily to make the aphicidal “Tea,” and would possibly do so again were it in demand.)

2. *Fish Oil Soap Wash*.—Made by dissolving the soap in hot water at the rate of 1 lb. to 125 gallons (final dilution). (*Note*.—Fish-oil soap, or whale-oil soap, may be obtained from P. Frankel and Co., Edward street, Brisbane.)
3. *Pyrethrum* (“Insectibane” Powder) *and Water*.—At the rate of 2 tablespoonfuls in a bucketful of water, the powder being first made into a paste with a little water.
4. *Kerosene Emulsion*.—One pint in from 20 to 25 parts of water. (*Note*.—For manufacturing this and the undermentioned, see any modern work on horticultural practice—*e.g.*, Mr. A. H. Benson’s excellent work on spraying, furnished, on application, by the Department of Agriculture and Stock.)
5. *Resin Compound*.—One part of resin saponified in 12 or 15 gallons of water.
6. *Hot Soap Suds*.—Cabbage plants will tolerate water, especially when this is applied in the form of a spray that is sufficiently high in temperature to be quite fatal to plant lice or aphides. In mentioning several remedies, one is actuated by the experience that the farmer often possesses one of a number of substances when he has not a single specified one.

In conclusion, it must be borne in mind when pursuing methods for the repression of these insects that only those that the insecticide comes in contact with are killed, although it may have a slightly repellent action for a few additional individuals; and that, therefore, seeing too that aphides, especially in early life, are small, it must be applied in a very fine state of division so as to reach everyone; in fact, in a mist-like form. This end can only be secured by the use of a proper spraying appliance that can so administer a fluid preparation.

Again, by reason of the great and rapid increase in their numbers in the course of their natural development, a few individual aphides, if suffered to remain alive, will soon give rise to a numerous host. Accordingly, treatment must not only be very thorough, but repeated as long as any living individuals are discernible.

It is the neglect of the occurrence of a few examples on young cabbage plants at the time they are planted that is usually the explanation of their subsequent appearance in immense numbers on the developing plants. Accordingly, immediately prior to the operation alluded to, the young cabbages should be dipped in one or other of the fluids mentioned, care being taken, however, lest the roots be at the same time brought in contact with it.

Generally speaking, what has been stated will apply to other kinds of aphids and their repression.

STACK ENSILAGE.

Amongst those who have experimented in making silage in the stack, opinions are diverse as to results. Some maintain that there is very little waste; whilst others say that from 1 to 2 ft. of the outside of the stack is useless as fodder, except when feed is very scarce. A practical experimenter

in New South Wales gives his experience, as follows, to the "Australian Field":—

"The evolution of our system came about in this way: It was found that the stack need not be high, and that when dead weight is to be used for pressure, the stack is better to be low. Excavated earth was found to be the best material for weighting, and by using an excavation for building the stack in, there was a further saving in the height to which the covering earth had to be elevated. An oblong tank was, therefore, made with plough and scoop 3 or 4 ft. deep, with sloping side, like an ordinary waterhole. In this the stack was built, and carried up to about 12 ft. above the surface. With shovels a layer of earth about 12 in. thick was built, and placed on the slightly rounded top. The stack sank to within about 2 ft. of the surface, and there was no waste. There was found to be no gain in having the 2 ft. of ensilage above the surface, and consequently in making these tank stacks we now carry them up only about 7 or 8 ft. There is then after settlement only the covering earth above the surface. This system is carried out in a dry district, where the soil absorbs all the rain, and there is no seepage to spoil the ensilage.

SOIL INOCULATION.

Professor Bottomley has recently been lecturing at King's College, London, on the results obtained by the use of bacteria for supplying nitrogen to soils deficient in that element. It is not long since great expectations were formed as to the possibility of increasing the fertility of the soil by this means, and it was even stated that a man could carry the manure needed for 5 acres of land in his waistcoat pocket. Of late, however, like many other projects, little has been heard of the matter. Professor Bottomley wished it to be understood that soil inoculation is not a universal panacea.

It simply meant adding nitrogen-fixing bacteria to the soil. Those bacteria were very delicate little things, and required very careful handling. They were not to be pitched out wholesale anywhere; the conditions must be suitable. The remarkable results obtained in America were in poor soil. Good soil did not respond to inoculation. The ideal soil for this purpose was soil poor in nitrogen. Soil which it did not pay to manure, or which it did not pay to farm, might be brought into cultivation so as to produce large crops if it were only looked after and provided with suitable bacteria. One of the most important facts brought out as the result of reports received was that the maturing of a crop was considerably hastened by soil inoculation, and that meant increased profits. Over and over again experimenters reported that they were growing their inoculated beans 3 weeks or a month earlier than their non-inoculated beans. One grower sent up his runner beans 6 weeks after the seed was put in, which was a thing never done before.

INTERESTING WHEAT-GROWING EXPERIMENT.

An experiment in wheat-growing, of great originality and much promise, is being made in Russia. The experiment (says "Australian Field") consists solely in the manner of cultivation. The author of the new method is General Levitsky, who began last August in a little model farm adjoining his barracks. He sows single grains of wheat at the bottom of conical pits 1 ft. to 1½ ft. deep. As the grain thus sown in the apex of the pits begins to appear above the surface it is earthed over, and each time the leaf appears more earth is filled in till after, say, five or six earthings, the pit is full and level with the surface. The result of this treatment is that the plant, which has a "branching knot" at the base of the original stem, and of each new stem, sends out a number of new shoots at each starting. It is asserted in a letter to "The Novoe Vremya" that one grain treated in this way sent up 19,683 shoots. The straw seems to be unusually stout, the yield enormous, and General Levitsky believes that the plant will be perennial.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE GATTON.

RECORD OF COWS FOR MONTH OF OCTOBER, 1908.

Number.	Cow's Name.	Breed.	Date of Calving.	Total Milk.	Average Test, Per cent.	Commercial Butter.	Remarks.
				Lb.		Lb.	
1	Pee wee ...	Holstein-Sh'rth'rn	20 May, 1908	791	3·7	32·56	First calf
2	Burton's Fancy	Shorthorn ...	6 Sept. „	621	4·5	31·41	
3	Grace ...	„ ...	20 May „	630	4·0	28·16	
4	Len ...	Ayrshire ...	22 Sept. „	724	3·5	28·09	
5	Ethel ...	Grade Holstein ...	3 Sept. „	652	3·7	27·03	
6	Carrie ...	Jersey ...	16 Jan. „	543	4·3	26·24	
7	Hettie ...	Ayrshire-Sh'rth'n	20 Mar. „	502	4·5	25·39	
8	Remit ...	Grade Holstein ...	6 Aug. „	648	3·5	25·15	
9	Rhoda ...	„ Shorthorn	28 Mar. „	600	3·7	24·7	
10	Sue ...	„ „	25 May „	636	3·5	24·68	
11	Glen ...	Shorthorn ...	10 Feb. „	378	5·4	23·37	
12	Nettle ...	„ ...	14 May „	609	3·4	22·92	
13	Ruby ...	Ayrshire ...	21 July „	536	3·6	22·47	
14	Winnie ...	Shorthorn ...	8 April „	538	3·5	21·52	First calf
15	Lark ...	Ayrshire ...	6 June „	523	3·7	21·52	
16	Lubra ...	Grade Holstein...	5 June „	488	3·9	21·23	
17	Night ...	„ „	5 Oct. „	644	3·0	21·2	„ „
18	Cocoa ...	Jersey „	10 Nov., 1907	496	3·6	20·8	First calf
19	Mona ...	Grade Holstein...	20 Oct. „	521	3·5	20·6	
20	Nancy ..	„ Guernsey	7 May, 1908	516	3·6	20·6	
21	Lady Loch	Ayrshire ...	21 June „	513	3·5	19·9	„ „
22	Lily ...	„ „	2 May „	506	3·5	19·64	First calf
23	Lalla ...	Grade Holstein...	28 July „	471	3·7	19·39	
24	Madge ...	„ „	16 June „	443	3·9	19·28	„ „

TREATMENT OF CALVES.

Little calves are like children. Early learned habits are remembered, and if you spoil your heifer you will have a spoiled cow. Never abuse calves, but make pets of them; let them have confidence in you. Train the little calves properly, and you will have a herd that will be a source of satisfaction and revenue to you.

ANGORA GOATS.

The mohair industry is gradually increasing in Queensland, there being at present, as far as is known, 4,589 angora goats in the State. The industry is still in its infancy, however, the production of mohair having only risen from 1,216 lb. in 1904 to 3,073 lb. in 1907, whilst the skins sold numbered 996 in the latter year as against 208 in 1904. One thousand and twenty-eight goats were killed for meat. Many of the grade animals are of a very poor type, and, as yet, few of the owners understand the subject of the production of marketable mohair, keeping the goats mainly for milk and meat, yet hoping to secure a further marketable commodity in the shape of mohair, without

extra care or trouble. We have repeatedly published articles, with illustrations on the subject of rearing angoras for mohair, in which minute details have been given, but apparently without great results.

In America and in South Africa it has been found that the angora goat of perfectly pure blood is much less hardy than other breeds, and its delicacy led the farmers in those countries, who embarked in the industry, to cross their imported angoras with local stock, as has also been done in this State.

The result has been to increase the size and strengthen the constitution, and also to raise greatly its mohair-producing capacity. It has been claimed for some of the best South African goats that they will shear as much as 20 lb. to 21 lb. each year, the average of the very best herds of goats being put at 11 lb. per head, whereas the pure-bred goat yields an average of 8 lb. only. This increased yield, however, has been obtained at the expense of quality; it is coarser than the hair of the pure-bred goat. The average American cross-bred angora is a poor creature; the imported stock was crossed with common Mexican goats, and the result is a light yield of mohair of coarse quality.

THE GORGONZOLA CHEESE TRADE.

A commission has been sitting at Milan to study, on behalf of the Italian Ministry of Agriculture, the results of the use of baritine (which contains sulphate of barium) in the manufacture of the crust of gorgonzola cheese. On this subject an American Consular report states that the Conseil d'Hygiene of France recently prohibited the importation of gorgonzola cheese on the ground that the sulphate of barium used in the crust might be injurious to health. As France is second only to England in the amount of gorgonzola consumed, it is of great importance to Italy not to lose the French market. At the present moment there is an especially good opportunity for gorgonzola cheese in France, because of the high price of roquefort, a cheese which so resembles gorgonzola that the two appeal to the same class of consumers. The commission have, therefore, lost no time in investigating the questions: (1) Is sulphate of barium injurious to the health when used to form the crust of cheese? (2) Supposing it to be non-injurious, are there no other substances which can be used with equal advantage and without giving rise to objections? The first question is answered in the negative. Sulphate of barium is innocuous, because it is insoluble, even in acids. There is indeed the bare possibility that some of the other salts which make up baritine might penetrate the crust and ultimately soak into a portion of the cheese; but such an event must be very rare, and the amount of salts which would be consumed in the cheese must be infinitesimal. Sulphate of barium, however, is not merely innocuous; it is unnecessary. It is not used in all gorgonzola cheese, but principally in the cheese destined for the world market, and especially during the summer months. Equally effective for the formation and preservation of the crust are a number of substances, such as various kinds of white clay, powdered talc, brick dust, &c. The commission recommends the adoption by Italian exporters of one of these substitutes for baritine, in order to remove every hindrance to the free development of the export trade. Experiments have already been undertaken by the chief producers of gorgonzola cheese, who are affected by the rejection of their shipments by the French Customs authorities at Modane. It is expected that they will soon find a means of making the crust of their cheese with some substance other than baritine, without imperilling thereby its durability for purposes of transportation.—“London Chamber of Commerce Journal.”

The Horse.

THE USE OF SAWDUST IN STABLES.

Not infrequently sawdust is made use of in stables as bedding material, and it undoubtedly answers very well for this purpose. It is true, of course, that this product of the sawmills is not by any means the equal of straw in this respect, which latter, after all is said and done, is the best and indeed an ideal kind of litter for use in the stable, but despite its general inferiority to straw as litter, sawdust nevertheless proves very useful in this direction. The outstanding feature of sawdust, in so far as regards its suitability for littering-down purposes in stables, is the fact that it possesses great absorptive powers for liquid, and in this particular respect it ranks considerably above straw. Whereas the absorptive capacity for liquid of straw amounts to only about two and a quarter times of its own weight, sawdust—provided it is perfectly dry—is capable of absorbing liquid to the extent of about four times its own weight. Thus, thanks to its great absorptive capacity, sawdust makes both a dry and a cleanly bed. It does not, it need hardly be said, afford such a soft bed for horses as straw litter, but still they are quite comfortable on it, provided the sawdust is put down sufficiently thickly.

Besides possessing great absorptive powers, sawdust also has certain deodorising properties, which fact considerably enhances its value and usefulness as a bedding material for use in stables. From a hygienic point of view it is certainly in every way excellent, it being absorptive, cleanly, deodorising, and cool to the feet. Those who have never used sawdust as bedding material in the stable may perhaps think that it is not particularly cleanly, but practical experience of it will soon prove to anyone who has any doubt about it that there is no cleaner kind of litter than sawdust. It is true, of course, that when the horse lies down on a bed of sawdust particles of the latter adhere to its coat or to its clothing, while some is also apt to adhere to the horse's legs, but it can be easily brushed off, and there is certainly no reason why sawdust should be objected to as a bedding material on this account.

The principal advantage which sawdust possesses as bedding material consists in its cheapness, and the fact that it can be obtained at a low cost is the chief and generally the sole reason why it is used in stables in preference to straw or peat moss litter. In stables where it is essential to observe the most rigid economy, the use of sawdust is certainly to be recommended, since a considerable saving can be effected by using it instead of straw. Sawdust cannot, however, be readily or cheaply obtained everywhere. It is available at a low cost only in some cases, and particularly in the neighbourhood of sawmills. Sometimes a supply of sawdust can be obtained from a sawmill practically for the asking, it merely being necessary to fetch it away.

Broadly speaking, it may be said that in bedding down horses with sawdust a little over 1 cwt. will serve a horse standing in a stall for a week. When a horse is quartered in a loose-box a correspondingly larger quantity per week will be required. Of course, when the supply is very plentiful, more than the above-mentioned weekly amount can with advantage be used, and a deeper bed be put down, thus rendering the latter all the more comfortable for the horse; 1 cwt. per week may be looked upon as being the minimum quantity of sawdust which is necessary in order to keep a horse comfortably bedded down, but if a larger quantity is available, so much the better. When sawdust is used as litter in a stable, the best method of management to adopt in regard to the keeping clean and renewal of the bedding is as follows:—First thing in the morning, after the stable is opened, all droppings, as well as all wet portions of the bedding, should be removed with the stable-shovel and

manure-skep, the holes which are made being subsequently filled up with fresh sawdust. The bedding should then be levelled, and this is best done by raking it over with a rake; but, failing the latter, the levelling must be done as best it may be with the stable-fork. During the daytime all droppings should be removed as often as possible, and in the evening wet portions of the litter should again be removed and replaced with fresh sawdust, and the whole properly levelled down. In this way sawdust bedding can easily be kept in good order and perfectly sweet and clean for a considerable time. At frequent intervals—say, once every seven or ten days—the whole of the sawdust should be removed or piled up in a corner of the stall, so that the floor may air properly, and get dry if it is wet. So long as sawdust remains dry it can be continued to be used, but, once it is saturated with urine, it is no longer serviceable. In using sawdust for bedding-down purposes, the floor of the stall or loose-box should be covered with it to a depth of, at any rate, 4 in., that being the minimum depth which the bed ought to have if a horse is to lie comfortably on it, but by preference it should be made an inch or two deeper than that.

It is most important, when sawdust is used, that it should be perfectly dry, otherwise it is unsuitable for use in the stable, damp sawdust both being unwholesome and not possessing much absorptive capacity. Sawdust which is obtained from unseasoned and green wood is unsuitable for use as bedding material in the stable, because it is not properly dry, and therefore deficient in absorptive power. One great drawback connected with sawdust is that it makes a bad manure. It decomposes but very slowly in the ground, and it takes a long time ere it gets thoroughly incorporated with the soil. For this reason farmers look askance at manure made from sawdust, and do not care about using it. The only way to dispose of it is to give it away.—“Live Stock Journal.”

[Sawdust is plentiful and cheap in Queensland towns, but it is not favoured as bedding by any who utilise stable bedding as manure, the reason being that before decomposing it becomes mouldy and injurious to plant life.—Ed. “Q.A.J.”]

CLIPPING HORSES.

All clipped horses, says a writer in the “Farmer and Stock-breeder,” should be liberally fed on rich foods that handsomely maintain the caloric—keep up the heat of the system. To clip an ill-fed horse, already very chilly for want of corn, is an absolute cruelty that should not only be severely tabooed in all horse society, but should subject the owner to legal proceedings. In our very slowly advancing civilisation the sympathies of mankind stretch out beyond the narrow confines of humanity, and the man who is cruel to animals is nowhere tolerated. If he cannot feed liberally he cannot expect great exertion, and he should then leave all the coat on the horse.

WHERE TO LEAVE THE HAIR.

When well-fed horses are clipped it is a good plan to leave hair on the extremities, where the circulation may be sluggish, and also on parts of the body which are much worn by harness. In good, well-managed stables hunters keep the coat under the saddle and on the legs, and to this should be added a large part underneath, where the girths may wear away first the short-clipped hair and then the skin, and also between the fore legs and between the thighs. What object there can be in crawling under a horse to take away the very fine and fluffy growth which is the only protection of the delicate inside of his thighs I never could understand. It does not improve his appearance, as that part is not exposed to ordinary view. It forms no part of the *tout ensemble*, and the thin hair does not materially increase the perspiration, therefore there is no object in taking it off,

Poultry.

REARING TURKEYS.

The following points of primary importance in connection with the habits of turkeys were outlined in the "Australian Gardener," by Mr. H. V. Hawkins, Poultry Expert:—

In the first place, the Turks had little, if anything, to do with this breed, so that the name "Turkey" was not given this excellent table bird by them, but rather by the Americans. Personally, I am inclined to the belief that the Mexicans discovered the wild turkey, but the credit for vastly improving and domesticating it, and raising the breed to the present standard of perfection, rightly belongs to the Americans. In any case I am content to know that the Americans have farmed turkeys for so many years, and have wonderfully changed their type, colour, and habits, with such splendid results.

The question so often asked is, "Why turkey farming has been so long neglected here?" Those who have done most for the Commonwealth in this regard, have been the squatters, who, in many cases, merely have a few at first to supply a change of menu from mutton. They have little time to devote to the care of these birds, still, in most cases, the result is a great success. The reason is not difficult to find—*i.e.*, turkeys being great travellers and foragers, must have acres. They may be seen in large flocks in the Riverina, miles from the station homestead. They have a decided objection to being fed on wheat morning and evening. I have taken particular notice of their method of feeding, and have invariably found that they had good appetites when variety of food abounded—*i.e.*, first a seed, then an insect; possibly a grasshopper would cross their track, and a bad time the grasshopper would get when a flock of 200 bronze turkeys set sail.

BEST BREEDS TO FARM.

The bronze turkey being large, and the flesh so beautifully white and succulent, is perhaps the breed *par excellence*, yet it should be always borne in mind that the 40-lb. gobbler is not the most profitable to breed. Birds of 14 and 18 lb. weight are usually those which consumers prefer, provided sufficient flesh is presented to the chef by which he can satisfy a fairly large number of visitors. The black turkey gobbler of good size, and 2 years at least, and unrelated, and twelve or thirteen large bronze hens (2 years old), make an ideal breeding flock. Many add a very large bronze gobbler, which is unsuitable for the hens, non-fertilisation of eggs being the result. Each hen averages eighteen to twenty eggs before going broody.

Turkeys need little attention if kept away from fowls and ducks. Turkey farming pays best by itself, and the northern areas are more suitable than the southern. They lay their eggs in a secluded spot; a cement barrel laid on its side with a brick each side to prevent rolling, and a branch of a tree partially covering its entrance, is all they want to encourage them. It is best to permit the eggs to remain in the nest. The hen is usually very cautious on entering and leaving her nest, and seldom breaks an egg, unless she has not had sufficient shell formers in her diet. See that she gets ample cinders, burnt bones, and charcoal, and, when possible, plenty of dry oyster shell. Much depends on the farmer whether she breaks the egg and hatches her young.

MAKING NESTS, ETC.

Always provide the hen with an inviting spot and plenty of green grass for the nest; a too dry nest often causes trouble—lack of moisture. In districts in the far north I have strongly urged that one side of the barrel be

removed; make the nest on the ground, oval in shape, and keep a fair amount of moisture around the nest. Give the hen opportunity to dust herself in a damp spot; she will get it if possible, and there will be little fear of dead chickens in the shell unless breeding from immature birds is practised. A gobbler at 12 months is not the best. He should be at least 2 years old; likewise the hens. Above all, introduce fresh blood every second year; this is of great importance in the raising of turkeys for profit. Again, a vigorous gobbler will fertilise all the eggs of a dozen hens in less than 4 weeks—that is to say, suppose a turkey hen, after she has had the companionship of her mate for say a month, lays seventeen eggs at a stretch, the whole batch laid prior to her brooding will be fertilised. In short, you need only borrow a good gobbler for one month in the season, provided you are not hatching late chicks. See that his toes are not like a razor, otherwise serious results may follow; I have, this season, stitched three beautiful bronze hens, the backs of which had been laid bare.

Of one thing there can be no doubt, turkeys do best in the fresh air, and will not stand coddling; they should be housed in large airy sheds, open completely on the eastern side, with perches fairly wide (3 to 4 in.). The straighter the breast bone, the better satisfied will the consuming public be, and narrow perches mean crooked breast bones. Do not place the perches too high, especially where the ground is hard or stony, as turkeys are, like fowls, subject to bumble feet, which often spoil hens for a whole season. I am quite convinced that turkeys must be encouraged to accustom themselves to shed roosts; they prefer the limb of a tree or the top of a harvester, but that should not be. A little coaxing for a week, a kindly bucket of oats by way of encouragement, will do much to form the habit of coming home each night at dusk instead of their straying away, or being found in the field in the morning with their heads off—the work of native cats, which are very troublesome in some districts.

FEEDING TURKEYS.

The adult birds usually find most of their own food, yet it is an absolute necessity to feed the flocks when natural foods are not available—*i.e.*, in autumn and winter they get down in condition if not attended to, although they have unlimited range. Insect life is then scarce, grass is of poor quality, and is also usually wet, and the consequence is they scour and often die from the effects. Barley meal, maize meal, and bran (one part each), with a fair amount of chopped-up boiled rabbit, and when available a few sliced-up raw onions, all mixed with the soup in which the rabbit or other animal food has been boiled, should be used. Mix as dry as possible; turkeys do not thrive on slops. Curded milk is much relished, and is a splendid flesh former, and a whitener of flesh; nothing is more objectionable than a fatty breast. Too much maize feeding, or a constant supply of wheat, will not improve the colour of the flesh. Oats are by far the best of the grains to assist in keeping down fat.

Fresh Water.—Always provide fresh clean water daily, and keep the vessel out of the sun; neglect in this regard will cause losses by disease. Add charcoal in case of bowel disorders; it is an absolute necessity in successful turkey raising.

Grit.—They must have an unlimited supply of grit, without which they suffer much from indigestion. Small pebbles, coarse sand, and pieces of broken crockery and smashed up burnt bone all aid in digesting their food; this is especially required prior to their going to roost.

Boiled Grain.—There is no necessity to boil any grain; they are better without it, and prefer the hard food to that of a sloppy nature.

Egg Producers.—The so-called “egg producers,” mentioned by some of my correspondents, would, if fed in sufficient quantities, in some cases assist egg production, but at what a cost? The best egg producer is insect life, and

when not available in sufficient quantities, add the best substitute—*i.e.*, beef and mutton scraps, sheep or bullock's liver, or rabbit, soaked in cold water overnight, and then lightly boiled. Use the liquid for mixing the morning meal and avoid making it pasty, but use the hands well in mixing hard and friable. Curded milk when available should be a magnificent aid to egg production, and when topping turkeys off for market, give them as much as they will take, as it softens and whitens the flesh; milk-fed turkeys eat like six weeks' old chickens.

Young Turkeys.—For young turkeys many successful raisers use hard-boiled eggs mixed with stale bread crumbs, and a little fine oatmeal, moistened with skim milk (crumbly, not sloppy). This is given the very young chicks for the first week, after which eggs should not be given, but plenty of finely-pulped raw onions added, and the milk curds, and a little dry bone meal and charcoal mixed well through. This not only keeps their bowels in order, but supplies the additional phosphoric acid necessary to quick growth of bone, and increases stamina, thus decreasing the chance of "leg weakness," a complaint to be guarded against. Encourage the very young turkeys to eat millet seed at night, and after 2 weeks feed on hulled oats for best results, until old enough to have a little wheat or oats.

Keep the young turkeys dry. Nothing kills sooner than long wet grass; once they get a soaking, death may be expected. Always keep them in confined pens, well sheltered from wind and rain. Do not on any account allow them on the dewy grass, but keep them in until the sun has dried the grass off a little. Examine all young poults for vermin, which is so troublesome at the back of the head and near the vent; hundreds of birds die through no other cause. The pest is similar in habits to the tick, holding on and penetrating the skull. The young birds should be freely dusted with insectibane, and a little carbolic paste applied at the back of the head. Neglect in this matter is the cause of many deaths. The fact that late hatches do not develop as fast as the early hatches is of importance to all farmers of poultry, be it turkeys, ducks, or fowls. The early chicks may be relied on to produce the best results. The longer a hen lays in a season, the more impoverished she becomes as a result of hard work. Thus we find the embryo becomes smaller and weaker, and if from these late poults we get bad symptoms, first catarrh, often the precursor to a more serious trouble—*i.e.*, roup, or, to make it clearer, a running at the nostrils is observed, and later, symptoms show a swollen head, from which arises an offensive smell.

Onion tops, dandelion, rape, and raw onion finely cut, and white clover, are without doubt the favourite green foods with turkeys; and they are rich in mineral salts, and valuable as correctors of blood. From 5 weeks old and on, this can be given mixed in the morning food (pollard, bran, &c.).

If the pasture has a variety of grass, so much the better, as they prefer variety, but if it be a dry droughty spot, sow lucerne in a 1-acre enclosure. After it becomes established, it will keep you supplied with green summer food, being rich in protein, and also an egg-producer.

Area.—One hundred adult turkeys could easily be run on 5 acres, but, unless you are compelled to fence, I would advise giving them full liberty, as they will not require so much feeding. It is rather difficult to say whether 3 ft. and three added wires on top will suffice to keep them in; much depends on the way they have been brought up. If at all wild 15 ft. would not keep them in without doctoring the wing joint.

Domesticated poults are usually tamer than Leghorns, and give less trouble in this respect. I would certainly recommend trying 3-ft. wire, with four plain ones above; but care should be taken when putting in posts. Do not use too thick a post, for this reason, that if the posts are "table-topped" they allow ample room for a gobbler to fly on to; the others will soon learn the habit.

The main thing in marketing is to top off and to grade the birds according to size, not putting three big gobblers in a crate with five or six wasters. Mark your crates first, second, and third quality, and you will be quite satisfied when account sales come in. Make the agent your friend, it creates confidence, and will do his best for you; the farmer who is always chopping and changing about makes a serious blunder. Keep in touch with your salesman; tell him how many birds you will have for disposal, and ask him to wire you when a scarcity of white flesh exists. Don't rush him with twenty crates when ten will suffice; the agent usually knows when to advise you to send, and the cost of a telegram often pays.

THE INSECT PEST.

One of the great and most important questions in poultry-keeping is the vermin question. These little pests swarm in some of the fowl-houses, and play sad havoc with birds of all kinds and ages—the weakest going first to the wall in the natural course of events. One little red bug we have long known as a terrible pest, but we have always found them congregating in large numbers in some hiding places, and then at night, when the birds are roosting, coming forth and sucking their blood as they perched and attempted to rest.

Lately they have been getting on the bodies of all sorts of birds, and not in solitary instances. We have been alarmed to discover how prevalent this evil has become, and so far as we have ever known this is an entirely new danger for poultry-keepers to meet.

We first discovered the presence of these pests on the bodies of fowls in the daytime when we were paying a visit to a large poultry-keeper's plant. The stock were out of sorts and ailing, and we began to examine everything as minutely as possible to find out what was the cause of the weakness of the birds, as some of them could scarcely walk.

We felt sure the birds were infested with vermin, and accordingly examined them carefully for lice, when upon turning aside the crest feathers we found even worse enemies in possession, for there we found thousands of these little red bugs literally massed upon the heads and up the quills of the feathers.

These little red bugs are very strong insects, although so small, and are very powerful antagonists when they are present in such numbers on fowls, and after this we found matters were pretty much the same in other instances, and we would warn poultry-keepers against what may prove a most damaging development of the insect question in poultry-keeping. Both cocks and hens seem to be attacked, and we found some beautiful Houdan stock cocks that were affected in the same way.

To remedy this state of things the greatest care must be taken to see that the perches are quite clean of these pests. We have often shown how the perches should be made to fit in sockets so that they may be examined and cleaned at the ends.

The great reason why this matter should receive immediate attention is that the winter laying is very largely dependent upon the preserved vitality of the fowls, and in seventeen out of twenty cases we are called upon to investigate in which fowls do not lay properly during the winter months we find the loss occasioned solely and simply through the ravages caused by insects that prey upon the fowls.

We have recommended burning up the old perches, and in cases where they are fixed they should be pulled out, and any bark-covered perches should be burned, and every part cleansed, so that it kills every one of the bugs. Were it not for small maggots or grubs that live on these red bugs, and turn

into a small light-brown moth, the case would be worse, as these keep the red bugs under in the old-fashioned fowl-houses.

Then as to the birds that are infested. Of course, these insects are not like fowl-lice; they are stronger ever so much, and to paraffin the birds is out of the question. Sometimes the insects eat right into the flesh in bad cases, and it is very essential that insect powder should not only be used freely, but care must be taken that the powder reaches right down to the skin where the insects are, so that they are killed, as the birds must stand a good deal of annoyance and pain where so dreadfully infested.

We have tried experiments, lasting over several days, to determine the best method of treatment, and the pyrethrum powder kills them in from 7 to 10 minutes, although fowl-lice would not last as many seconds, and the specially-prepared insect powder, if the insects are covered, kills every one. Of course, when the insects collect in such large numbers upon the head, the skin must be well covered; but great care must be used to guard the eyes of the bird well, as the insect powder must not be allowed to get into them, as it would cause great pain.

After the head has been well dusted, the superfluous powder should be wiped off with a dry cloth. We trust our readers will examine their birds for these bugs, as we find that the bugs continue on the fowls' heads, and this year they have extended their operations to other points of the body, and prove an almost fatal pest to the birds.

The great secret in the career of most poultry-keepers, successful or unsuccessful, generally turns out to depend very much upon the amount of pains bestowed upon the minor details of management.—“Farm and Field.”

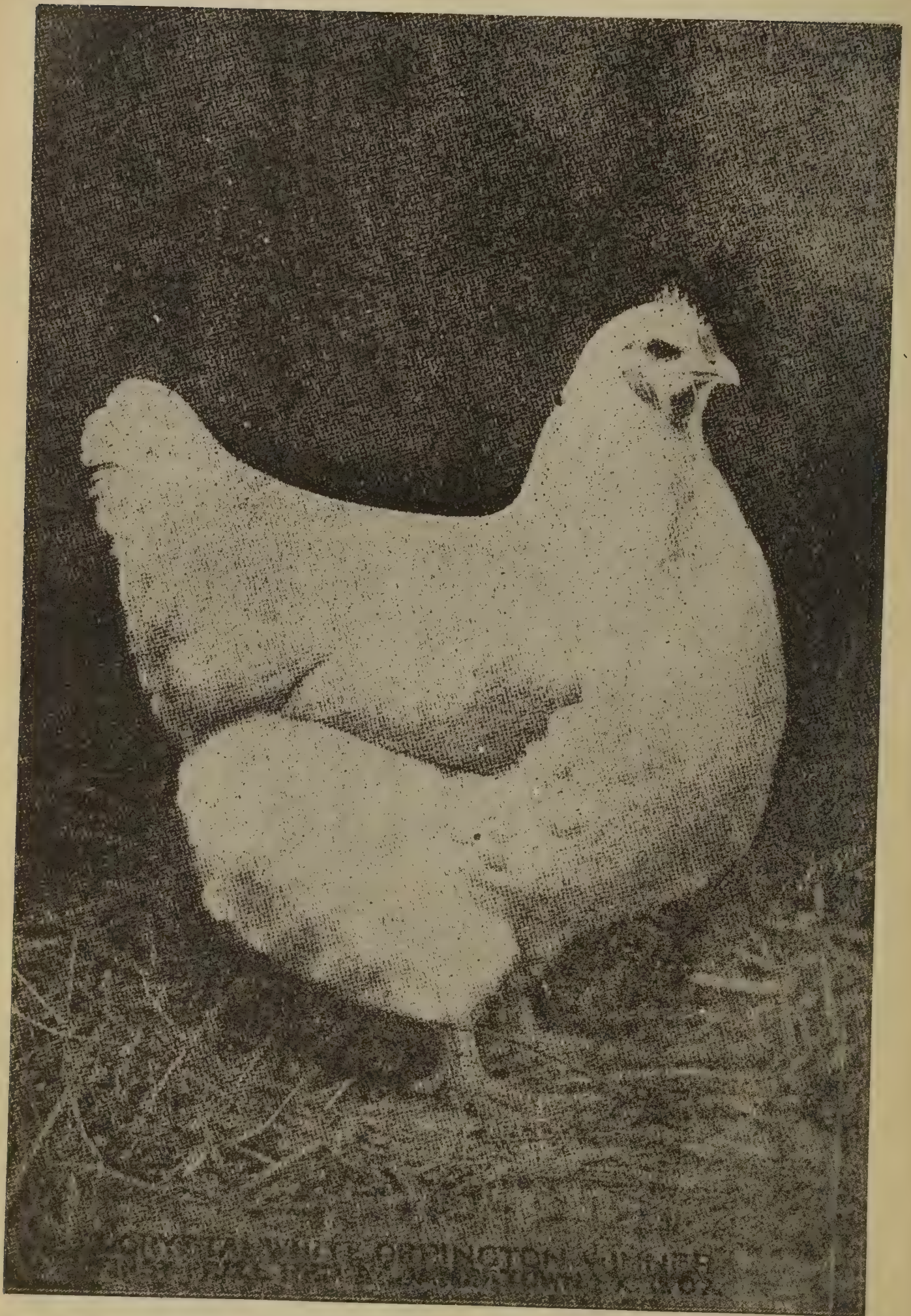
PREPARING FOWLS FOR SHOW.

At all Queensland shows, whether metropolitan or country, poultry form an interesting section amongst the exhibits, and it is to the interest of exhibitors to present their birds to the judges in the pink of perfection. A few hints on preparing them for exhibition will be of some use to the amateur exhibitor.

There are two chief points in preparing a bird for the show-room—First, quietness; and second, cleanliness. Good advice in this respect is that given by R. H. Crosby, in the “American Poultry Journal.” He says, in respect of the above two qualities:—

By quietness is meant birds that are easily handled, and will not be scared nearly to death when in a coop. The fancier can train his birds for the show just as a horse is trained for a race. Starting, say, a month before the show, the birds that are to be exhibited should be handled as much as possible, so as to get them good and tame. If the show specimens are placed in a coop at night, and fed in the morning before letting them out, they will soon become used to the coop. While shut up, they should be taken out of the coop and handled, just as a judge would handle them at a show. A short cane should be kept handy, and the bird taught to pose when touched with it. If this treatment is kept up, your birds will show up far better than your neighbours' birds that have not had such good preparation.

While your birds are showing themselves off to the best advantage, your friends' untrained birds are huddled up in the far end of the coop, and are afraid to stand up for inspection. Thus it will be seen that much is to be gained by training your birds for the show, for, even if your birds are not quite as good as the other fellow's, your specimens will show up far better than the other party's scared-to-death birds. Anyone who has ever visited a show knows that the above is perfectly true, and, while some birds were looking their best, some others would be found huddled up in the back end of the coop.



THE KELLERSTRASS WHITE ORPINGTON HEN VALUED AT £2,000.

In the second place, your birds must be clean from beak to toe, and most birds are the better for a good washing. Of course, if your birds are not white, and the plumage looks good and clean, then it is not advisable to wash them unless you understand the job from start to finish, for the writer remembers the mess he made of the first birds he attempted to wash. But most all white birds are better for a thorough washing. To successfully wash a bird, you will want three tubs. In tub No. 1 place clear warm water; in the second, warm water with a quantity of soap dissolved in it, and made into suds, and tub No. 3, containing warm water with a little bluing added. An assistant is necessary, for one person cannot manage alone very well. Now bring in your birds (you should borrow the kitchen for the job), and provide a light coop for them. Catch a bird, and, while your assistant holds it in the water of tub No. 1, you should thoroughly wet all the feathers. Be sure and have all the plumage well soaked. Now, squeeze out as much water as you can, and then place in tub No. 2. And now the real work commences. Take a bunch of feathers in one hand, and thoroughly wash them with the other. Don't be afraid of hurting the feathers, for a wet feather will stand a lot of rubbing. A tooth-brush should be used to clean the legs and feet, being sure to get all the dirt out of the cracks and corners. The water should be pressed out of the feathers as much as possible, and the bird is now put into No. 1 tub again, and all the soapy water rinsed out of the plumage. Now place your bird in the third tub, and be sure and get the blue-water thoroughly into the feathers. Press out as nearly dry as possible, and give the bird a toss up in the air to get the feathers loosened up, and then place in the coop to dry. Be sure you get the head and feet perfectly clean. Before sending or taking your birds to the show, rub up their legs with a soft cloth to which a little vaseline has been applied. The comb and the wattles should be treated in the same manner. If you don't wash the plumage, be sure and clean head and feet, for a bird with dirty legs and feet is not a nice specimen for a judge to handle, and he will give preference to the clean bird every time. In conclusion, I wish to say that I trust these few lines will be of some use to a new hand at the game.

A £2,000 HEN.

In June last we published an account of the sale of five white Orpingtons for £1,500. They were purchased from the Ernest Kellerstrass Poultry Farm, in Kansas, U.S.A., by Madame Padarewska, wife of the celebrated pianist Ignace Jan Padarewski. Mr. Fern, Poultry Expert to this Department, has furnished us with the illustration here reproduced of the mother of the above-mentioned five chicks, which the owner values at £2,000. He states that he is prepared to pay £2,000 for a "Crystal" White Orpington that will equal her in every way.

ZAPUPE FIBRE PLANT.

An article dealing with the rapid extension that has of late years taken place in the cultivation of the "zapupe" fibre plant in Mexico was given in the "Agricultural News" (Barbados) of 18th April last, page 125 (says that journal). Within a period of two or three years after the cultivation had started, no less than 4,000 or 5,000 acres were devoted to the growth of the fibre plants, and the industry is reported to be a remarkably remunerative one.

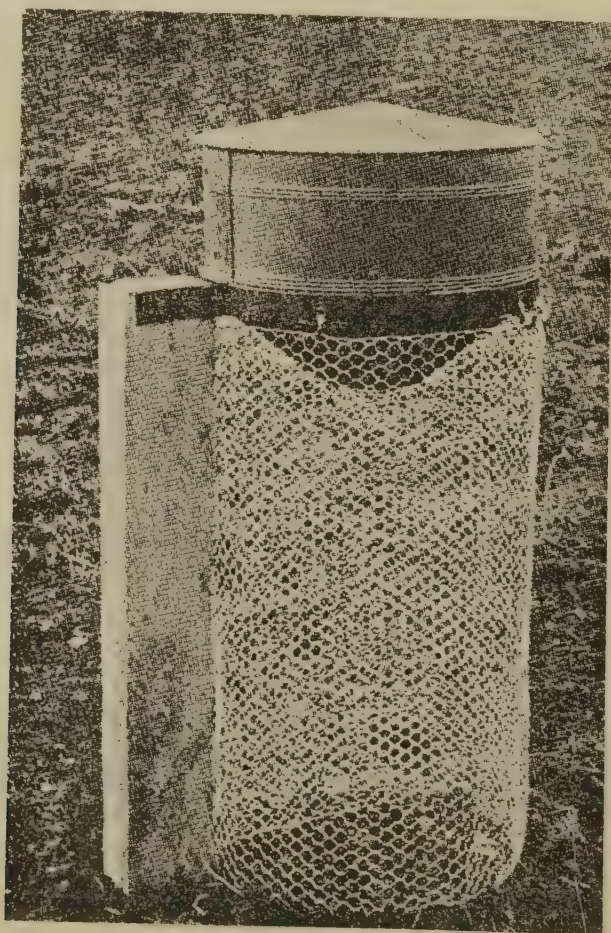
The specific identity of the "zapupe" has not yet been established, but, so far, it has been considered to be a species of Agave. In the course of an article contributed to the "Tropenpflanzer" of April last, however, Dr. Endlicher states that his observations lead him to believe that, as in the case of "ixtle," the "zapupe" fibre is probably produced from more than one species of plant, and it seems likely that the chief plant from which it is obtained belongs to the natural order Bromeliaceæ, and is not a species of Agave.

The Orchard.

A SUCCESSFUL BIRD-SCARER.

The following description of an ingenious appliance for scaring birds from fruit trees and seed beds is given in the November issue of the "Fruit World." The report of a gun, and especially a double report, suffices to drive away any kind of bird, and this invention, which relies upon loud detonations, deserves to be experimented with. We therefore willingly give it publicity in the Journal, in the hope that it may prove of service to some of our readers. The appliance may be obtained on application to The Farm and Dairy Machinery Company, 517 Collins street, Melbourne. The price, including 800 cannons and fuse, is £2 9s. 6d. The "Fruit World" writes:—This cheap and unique invention has already become a necessity to every orchardist. This is the first season that it has been placed on the market, and already growers are giving it great recommendation. In the Somerville district Mr. G. G. Cole, a prominent nurseryman and fruit-grower, has been experimenting with this Automatic Bird-scarer. By means of simple automatic mechanism large crackers, imitating gun-fire, are exploded at various intervals without any personal attention being required other than to charge the machine with supplies every one or two days as needed. Mr. Cole thinks that the invention is a great boon, and he has gone to considerable trouble to interview the Minister of Agriculture of Victoria to obtain permission for orchardists to store fireworks, and has been successful, the Commonwealth now allowing orchardists to store 200 lb. of fireworks on payment of 1s. license per annum. Mr. Cole says he expects good results as regards scaring the starling in particular, and fruit-growers have now a ready means of saving a very large portion of their crops of cherries, plums, pears, apples, &c., which are usually destroyed by birds.

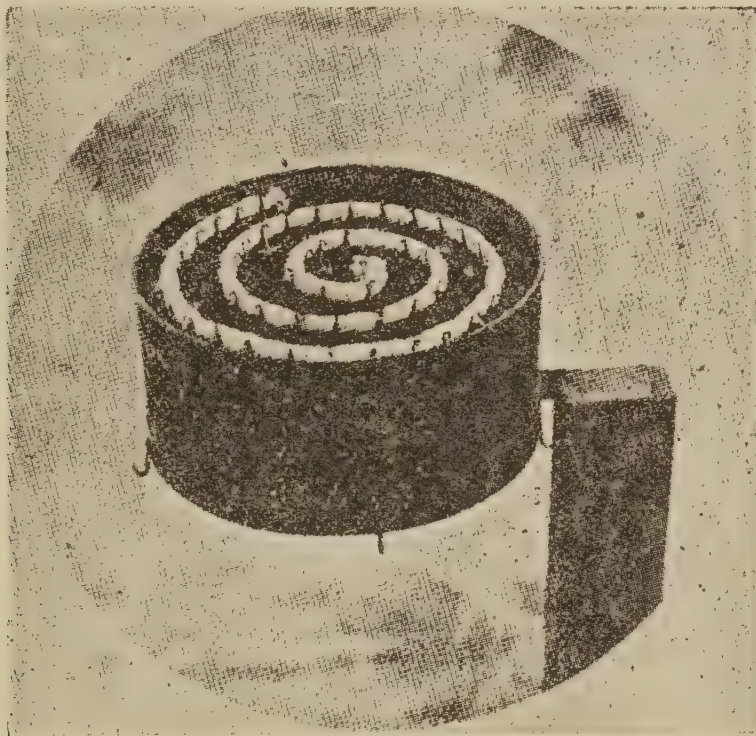
This experiment of Mr. Cole's is undoubtedly one of the finest recommendations that the Automatic Bird-scarer could obtain, and is a recommendation



BIRD SCARER.—THE CASE CLOSED.

to every grower in Australia. Some of the prominent users in Victoria are Mr. Barnett, of Mildura; Mr. H. M. Sargood, of Macarthur; Mr. A. Hartwick, of Germantown; Mr. H. Gray, of Buln Buln, and others; and any growers who are adjacent to these can readily become acquainted with the invention. In New Zealand a large number of growers are using the scarer with great success. As one to four machines in every 10-acre lot will approximately save three-quarters of the fruit, the value of the small outlay in purchasing machines and crackers is considerable, and will give a big profit. Even if only twenty cases of fruit were saved in the 10 acres, it would pay the cost of the machines, and leave a considerable profit, so that our previous statement that every orchardist must use them if he requires to obtain more profitable returns, is a correct one.

Besides being useful in the orchard, it is of immense value in the field where seeds have been sown, or in large or small private gardens. Briefly described, it consists of a circular metal case, about 14 in. in width by 8 in. in depth, in the top end of which is fixed a spiral strip of iron, along which is arranged a series of hooks and forks, adapted to receive a length of slow-burning fuse and large cannon crackers, one or more of which can be suspended from each hook in such a way as to bring its fuse in contact with the slow fuse. The machine being charged, one end of the fuse is ignited and the cover closed.



BIRD SCARER.—THE CASE OPENED.

As the slow fuse gradually burns away, it ignites each cracker in turn, causing a loud explosion every 15 or 20 minutes, or more or less often as desired, and will continue firing periodically for about 15 hours without further attention, and can also be set in the evening to begin firing off at any hour next morning.

Mr. Cole reports as follows:—"Dear Sirs,—With regard to Bird-scarer, I think it is the best I have seen so far. I have given the first one I got a thorough trial, and find it works very satisfactorily, so I have sent in another order. I am sure it does not run into more than 1s. per day at the outside, and the birds, I am confident, will never get used to it. A good point is that you can regulate it to have a double explosion now and then, and I find the birds do not like the guns at all. I have been a heavy loser by birds, and have tried everything to keep them away; but I feel sure that I have struck the right thing this time."

Botany.

CONTRIBUTIONS TO THE FLORA OF QUEENSLAND.

By F. MANSON BAILEY, F.L.S., Colonial Botanist.

Order CRUCIFERÆ.

SISYMBRIUM, Linn.

S. Irio, *Linn.* London Rocket. An erect hard-stemmed annual plant, 1 or more feet high, smooth. Leaves runcinately-pinnatifid; the lobes toothed, terminal one elongated. Flowers small, yellow, in erect racemes. Pods on more or less spreading pedicels, 2 or more inches long, slender, often all turned to one side.

Hab.: Europe, in waste places and roadsides, met with as a weed at Ipswich, *T. F. Hall*.

*RAPHANUS, Linn.

Sepals erect, subsaccate at the base. Stamens free, edentate; pod elongate tereta, continuate or moniliform, indehiscent, contracted between the seed, separated by a pithy substance filling the pod.

R. Raphanistrum, *Linn.* Wild Radish or Jointed Charlock. An erect or spreading annual or biennial, 1 to 2 feet high, much branched, and bearing stiff hairs on the thicker parts. Leaves pinnately lobed, the terminal segment large; rough with short hairs. Flowers; calyx very erect; petals either white with coloured veins or pale-yellow or lilac. Pod usually 1 to 1½ inches long, nearly cylindrical when fresh, and terminating in a long, pointed, or conical style when dry, often separating in joints between the seeds.

Hab.: Europe; often introduced with lucerne seed, and has become a farm weed.

Order BIXINEÆ.

COCHLOSPERMUM, Kunth.

In "Flora Australiensis," Bentham, referring to the fruit of *Cochlospermum Gregorii*, F. v. M., seems to have considered that the fruit described of this species in *Fragm. i.*, 71, belonged rather to *C. Gillivraei*—a conclusion which anyone might arrive at, as, from capsules I have just received from Mr. J. A. C. Wilson, of Croydon, I can find no mark by which the capsules of the two species can be distinguished the one from the other. The principal distinction is in the foliage—in *C. Gillivraei*, leaves palmately divided to within ¼ or ½ in. of the base into 5 or 7 lobes; *C. Gregorii*, leaves pedately divided to the base into 7 narrow-lanceolate segments. From the Croydon specimens, I should think this latter species was of a larger growth, and that the leaves were more abundant at the time of flowering.

Order LEGUMINOSÆ.

ACACIA, Willd.

A. purpureapetala, *Bail.*, "Queensl. Agri. Journal," XV., 780. To description add:—"Pod about 5 lines long, 3 lines broad, tapering towards each end and veined, the margins ciliate. Seeds disciform, dark-brown; funicle red, very short. The specimens, bearing pods, from Dr. T. L. Bancroft, Stannary Hills."

Order MYRTACEÆ.

EUCALYPTUS, Lhér.

E. stannariensis, *Bail. sp. nov.*; "Dead Finish." Said to form a handsome tree of about 100 ft. in height, with a diameter of 2 ft. at base of stem. Wood yellowish, considered of little value as a timber. Bark resembling somewhat that of the Moreton Bay Ash (*E. tessellaris*); but it is more flaky and spongy, especially on the lower portion of the stem, and in this respect somewhat closely approaches in bark the Yellow Jacket of Paroo (*E. ochrophloia*)—"Yapunya" of the natives—the colour of the two barks being nearly alike. This kind of bark is said to cover the lower two-thirds of the trunk; the rest and branches have a yellowish naked appearance from the close smoothness of the bark. Branchlets slender, weeping, more or less purple or reddish and angular, but soon terete. Leaves 3 to $4\frac{1}{2}$ in. long, 5 to 8 lines broad, falcate, oblique at the base and shortly tapering to slender coloured petioles of about 6 lines, much tapering above the middle to almost thread-like points; veins all fine, the oblique almost parallel ones rather close, reticulate ones forming a rather close network, intramarginal nerve rather distant from the edge. Oil dots scattered, rather large, not numerous. Panicles lateral, angular as well as the branches, umbels not numerous, usually of few flowers (1, 2, or 3), shortly but plainly pedicellate. Operculum thin, hemispherical, shorter than the calyx-tube. Calyx-tube not prominently veined or glossy. Stamens about 3 lines long, inflected in the bud; anther ovate-oblong with parallel cells. Ovary somewhat flat-topped, style nearly as long as the stamens, stigma not broader than the summit of the style. Fruit semiglobose, 4 lines diameter, scarcely or not contracted at the top, rim broad, convex, the valves slightly projecting, 3 rarely 4-celled. Seeds angular.

Hab.: Stannary Hills, *Dr. Thos. L. Bancroft*.

Dr. Bancroft tells me that the vernacular name is derived thus:—"Bushmen, when making a damper, found good cinders or coals could be obtained by burning pieces of this wood, but when the coals were raked about preliminary to placing the damper in the ashes they went out. As long as you left the fire alone it burnt well enough, but when interfered with went black."

Order ARALIACEÆ.

ASTROTRICHE, DC.

A. longifolia, *Benth.*, var. *glabrescens*, *Bail.* This only differs from the normal form in being of a glabrescent character.

Hab.: Moreton Island, Field Naturalists' Excursion.

Order COMPOSITÆ.

*CARTHAMUS, Linn.

Capitula homogamous; florets all fertile (rarely outer 1-seriate female or wanting.) Involucre ovoid or subglobose; bracts many-seriate, imbricate below, the outer or intermediate foliaceous and spinescent in wild forms. Receptacle plane, setose. Pappus more or less paleaceous, many-seriate, occasionally wanting. Thistle-like rigid herbs, with alternate spinose-pinnatifid or spinulose-serrate leaves, and terminal solitary or cymose, rather large, often fiercely involucrate, scarlet yellow whitish or rose capitula. Chiefly confined to the Mediterranean regions and Levant.

C. lanatus, *Linn, Sp. Pl.* Yellow Distaff-Thistle. An erect more or less pilose annual, simple below, $1\frac{1}{2}$ to 2 feet high. Leaves spinous, 1 to 2 inches long, the upper ones sessile, acute, semi-amplexicaul, lanceolate; floral ones

similar.—*Kentrophyllum lanatum*, DC. This plant, like many of our other weeds is a stray from garden culture. Specimens of the above plant have been sent to me by Mr. J. T. Milson, shire clerk, of Winton, where, if not checked, it will likely prove an addition to our noxious weeds.

Order LORANTHACEÆ.

LORANTHUS, Linn.

L. tenuifolius, *Bail.*, Bot. Bull. XVI., 1, June, 1903. This specific name having been previously applied by Engler to a tropical African species of the genus, change to *L. Beauverdiana*, *Bail.*

Order EUPHORBIACEÆ.

PHYLLANTHUS, Linn.

P. urinaria, *Linn.*, Flora Austr. VI., 102. "Te-no" of Mapoon natives. An erect ascending or procumbent glabrous annual or perennial of 1 to 2 ft., with angular stems and numerous slender branchlets resembling pinnate leaves. Leaves distichous, narrow-oblong, nearly sessile, often all under $\frac{1}{4}$ in., but sometimes nearly $\frac{1}{2}$ in. long on the main stem. Stipules small, often bordered with white. Flowers minute, nearly sessile, the females solitary with or without 2 or 3 males, all turned to the lower side of the branch away from the leaves. Male perianth of 6 ovate or obovate segments, about $\frac{1}{4}$ line long. Anthers 3, distinct, erect on a column nearly as long as themselves, the cells parallel. Glands globular. Female perianth-segments narrower and more rigid than the males, about $\frac{1}{2}$ line long. Ovary 3-celled. Styles free, spreading, dilated and 2-lobed at the end. Capsule depressed-globular, scarcely furrowed, scaly-tuberculate or almost muricate. Seeds more or less distinctly marked with transverse ridges or rows of tubercles. *P. echinatus*, *A. Cunn*, Herb., Benth. l.c.

Hab.: Mapoon, *J. F. Bailey*; Stannary Hills, *Dr. T. L. Bancroft*.

DESTRUCTION OF RATS IN CANEFIELDS.

We have been asked to suggest a plan for destroying rats, which often cause havoc amongst the sugar-cane. Some years ago (1899) the late Mr. E. Long, of Habana Plantation, Mackay, adopted with much success the following plan:—As soon as the crop was off (as nothing can be done amongst full-grown cane) great slaughter was caused by laying baits of ripe cane; the cane being split into two or more pieces, 6 in. long, and saturated by dipping in a 2 per cent. solution of strychnine. As long as there was little new cane to be got, these baits proved an irresistible attraction to the rats; after the cane was up the rats were not so keen, and a new medium of bait had to be tried. The following was the most successful:—Green sweet potatoes sliced up into small pieces (the small tubers were mostly used), allowed to dry for twenty-four hours, and then, as with the cane bait, dipped in a 2 per cent. solution of strychnine. These were freely taken by the rats, of which large numbers were destroyed.

Another simple plan, said to be very effective, is worthy of trial: Dress plenty of bits of straw with strong birdlime, and spread these thickly on the ground around the burrows. Amongst the straws throw some attractive bait—barley or malt sprinkled with oil of carraway is a good draw. Next morning the straws will be found gathered up in little bundles, and in the centre of each will be found a rat, dead or alive.

Horticulture

FLOWER GARDENING, No. 11.

By THE EDITOR.

PLANTS SUITABLE FOR OUTDOOR CULTURE.

GODETIAS.

These are a very fine class of showy free-flowering annuals, well suited for beds and borders, their large, bright-coloured flowers rendering them very attractive. They have been called by some growers "Annual Azaleas."

VARIETIES.

Godetia gloriosa.—A very showy, dwarf, compact plant, with large, satiny, brilliant deep blood-red flowers. It is the darkest coloured of all the Godetias; Marchioness of Salisbury grows about a foot high, bears a profusion of very beautiful flowers, which are bright carmine-crimson, the petals having broad, clearly-defined light margins; Bijou-White, dark rose spot, dwarfest; the dense bushes bear innumerable flowers. The Bride, crimson and white; Duchess of Albany, when in full bloom, this resembles a miniature rhododendron, so profusely is it covered with its trusses of satiny-white flowers. Other beautiful varieties are—General Gordon, Mandarin, Princess Henry, Duke of Fife, Duke of York, Whitneyi, &c.

SALVIA.

Salvia is a large and widely-distributed genus of plants, including annual and biennial, perennial herbaceous and evergreen species. The salvia has been found in various parts of Europe, Asia, Africa, and America, some of the most ornamental species being natives of South and Central America. A number of the herbaceous species have been cultivated in Victoria, many of which were insignificant as ornamental plants, while others, as *S. azurea* and *patens*, are, on account of the beautiful shades of colour of their flowers, most worthy subjects.

The most popular salvia cultivated here is Bonfire, a garden variety specially valuable for its display of bright scarlet flowers during the summer and autumn months. Gloire de Studgardt closely resembles Bonfire, being somewhat heavier in type of flower and habit of growth. Either kind is valuable for decoration of mixed groups, or for bedding purposes. The flowers do not last long on the bushes, but the calyx, which is about half an inch in length, is also bright scarlet, and lasts for a considerable time. There are several other shrubby kinds that are worthy of a place in the garden, being free-blooming plants, and of easy culture. The common sage, *S. officinalis*, is a member of this genus, and is not more hardy than several varieties grown for their flowers.

Most of the salvias will grow into nice bushes from 3 to 5 ft. in height, and flower well in any garden soil. Bonfire may be seen growing in the public gardens and nurseries in any part of the metropolitan district, thriving splendidly in the most widely different soils. If the plants are given a fair amount of water during the summer, and are sheltered from devastating winds, they will grow practically anywhere.

S. patens requires a cooler and more shaded position to attain perfection than any other kinds. It is one of the most beautiful of the genus, producing spikes of bright blue flowers. The variety is tuberous rooting, and is propagated by divisions of the tuberous roots in spring, or from cuttings of the

young shoots in a hothouse or hotbed frame. It produces seed freely, and young plants raised in spring in pots or boxes of soil placed in a cold frame will bloom during autumn.

S. azurea produces plants of a pale-blue colour, and will thrive under ordinary border treatment in almost any kind of soil. The habit of growth is loose and straggling, the plants requiring to be staked and trained as growth advances. Propagation is effected by division of the crowns in spring, the plants producing sucker-like growths like a chrysanthemum.

In many gardens salvias—Bonfire and Gloire de Studgardt—are treated as annuals, young plants being raised each season from seeds. The plants seed freely during the summer, and this method is undoubtedly the easiest. Seed should be sown for early planting in heated frames, for later in cold frames. The plants are cut down by frost in winter unless protected. The plants are watered sparingly during winter, and are placed in heat and started into growth early in spring. Cuttings of the young growths, about 2 in. long, are inserted in sandy soil and root readily, after which they are potted and kept growing and gradually hardened preparatory to being planted out in October and November. Such plants will bloom early in summer, successive plantings till early in January ensuring an abundance of bright flowers until winter. In places where frost is not severe the old plants will survive and break into growth near the base in spring. They may be pruned back to the young growth, and will make large plants during the summer, but, on the whole, young plants each season, whether from seeds or cuttings, are more satisfactory.

VARIETIES.

Other shrubby kinds worthy of culture are—Bethelli, bright rosy-pink flowers, tipped with white; Bruanti, scarlet; Hoveyi, dark purplish blue; *Grahami purpurea*, purplish crimson; *Rutilans*, magenta; and *Splendens*, scarlet. These are evergreen shrubs, that may be propagated from cuttings inserted in sandy soil in autumn. The *Salvia* thrives in our light soils, and will blossom until killed by severe frost.

ASTERS.

Asters are very showy plants for beds and borders; they bloom abundantly in almost any soil and situation, and cannot be surpassed for cut flowers. When well grown, nothing can exceed the chaste loveliness and exquisite colour blendings of a nicely-arranged bed of choice asters, and certainly no plant can be more easily raised and grown to perfection. They are half-hardy annuals, producing a profusion of bloom, in trusses of six to eight heads, of beautiful colours, stripes, and spots, 3 or 4 in. across. Light rich soil, with a mulching of manure suits them best. As a rule, asters should not be sown before September, and, to ensure a succession of fine blooms, further sowings may be made up to January. These latter, although they will not probably produce such fine blooms as those sown earlier, will be found exceedingly useful. As already stated, asters will thrive and flower in almost any good garden soil, but, if really fine blooms are required for exhibition, it is advisable to have the soil well broken up, and a good quantity of thoroughly-decayed manure worked in. The healthy growth of the plants and the development of fine blooms are greatly assisted by the occasional application of liquid manure up to the time of the plants showing the flower, when it should be discontinued. Seed may be sown in spring and autumn. They are the better for being transplanted. Give plenty of water during dry weather.

VARIETIES.

Surprise Aster; Sunlight, a fine yellow aster, attaining a height of 15 to 20 in., with flowers 3 to 4 in. in diameter; Ostrich Plume, Malmaison Rose, bears immense double flowers, 4 in. across, beautifully curled and twisted—

colour, white with pale-lilac; Victoria Dwarf; Mignon; Comet; Giant Emperor; Perennial, single large flowering; Lady in White; Imbricated Pompom; Pink Empress; Perfection, &c.

AMARANTHUS.

This is one of our most valuable annuals, which enlivens our gardens with a perpetual profusion of its ball-formed, purple, orange, and white blossoms. The Aramantaceæ are ornamental chiefly for their foliage and handsome habits of growth, which render them very striking in beds and masses. The leaves have a tropical appearance, gorgeous in crimson and gold, green and yellow, which deepen in the autumn. They are beautiful border plants, requiring plenty of room, good soil, and a warm position. They are hardy annuals, and should be sown in September, October, and November.

VARIETIES.

A. salicifolius has graceful leaves, shading to a bright orange-red; *A. tricolor* has long rose, yellow, and fiery-coloured leaves; of this variety *A. Queen Victoria* is a magnificent exponent; Firebrand, large leaves, deep blood-red, with bright yellow edges; grows to a height of 6 ft. *A. Henderii*, leaves carmine, orange-yellow, and green. *Gomphrena globosa*, Globe Amaranth.

POPPIES (*Papava*).

This magnificent family of plants includes some of the most lovely colours and shades to be found in the floral world. The Single Shirley, Iceland, and Tulip poppies are charming, and the double varieties are gorgeous in their colouring. They are easily cultivated. All they want is good soil and plenty of room. They should be planted in clumps during the spring where the plants are intended to remain, as they do not bear transplanting easily. The varieties of poppy, both as regards size and colour, are very numerous, bearing the names of Pæony, Ranunculus, and Carnation-flowered.

ORIENTAL POPPIES.

These great poppies are without doubt the most gorgeous of our early summer flowers. Their blooms, from 6 in. to 10 in. in diameter, are of a brilliant scarlet colour, and the large black blotch at the base of each petal, and the central mass of anthers, liberally supplied with pollen, that looks like deep-purple soot, make the scarlet petals appear still brighter when the flower is looked at closely; while a group of established plants, each plant well furnished with its flaming flowers, forms the most gorgeous spectacle that can be enjoyed in a garden, whether seen from afar or near. There are many cultivated varieties, differing in size, habit, and colour of flower. Some may be called a deep-orange, while in others the scarlet is softened in the direction of salmon colours, the buds when first showing colour being in this case of a very delicate salmon-pink. A group of five or more strong clumps makes a magnificent effect in a flower border. It is as well to cut away a good number of the weaklier flower stems, as the plants always bear more than are needed. Unfortunately, they require staking; the great heads of flower are so heavy that the stalk, unless supported, is in danger of breaking down from the very root, but it is best to stake at only half their height—not only that less stake may be seen, but also that the upper half of the stalk may bend about at its own will, for though some stems grow well upright, a good number—and often those with the largest flowers—twist about with the slightest wind.

VARIETIES.

The Shirley, single and semi-double, with charming shades of pink, rose-margined, and veined; Mikado, double, pure white and scarlet; the petals are fringed. The Bride, the flowers are very large, pure white, and the petals

nearly entire at the base. It is very useful for cutting purposes, but the flowers must be cut as soon as barely expanded, and then they will stand for a considerable time. Victoria Cross, this is a magnificent variety, of a rich vermilion colour, with a pure white cross. Tulip Poppy, this variety rises to a height of 12 to 14 in., and produces, high above the foliage, fifty or sixty large and splendid flowers of a vivid scarlet. Other beautiful varieties are—The Peacock, Mephisto, White Iceland, Double French, Umbrosum, *Nudicaule aurantiacum*, &c.

ESCHSCHOLTZIA.

The Eschscholtzia is a very beautiful Californian annual. A very showy plant, with handsome, hoary-green, much divided foliage. It wants plenty of space, will thrive in any ordinary garden soil, and is very hardy. Sow in the autumn and spring where the plants are to remain, because, when transplanted, they are a very long time before they start growing again.

Californica, bright yellow; *Californica alba plena*, double white; Mandarin, scarlet, rich orange inside.

PORTULACCA.

There are many varieties of the Portulacca, both with single and double flowers. A bed of these plants, when in full blossom, may aptly be likened to a stained-glass window. Nothing in the garden can equal it in dazzling beauty and effect. The beauty of the bed is, however, of short duration, as the flowers do not open until about 10 o'clock, and close again about 2 in the afternoon.

The seed should be sown where the plants are to remain, and they do better in the open ground than in flower pots. If sown in spring and summer the seed will germinate, and the plants become strong and large, and of healthy growth before requiring to be watered, whereas in pots the soil soon dries, and the young plants on first germinating are either destroyed by drought from being left unwatered, or, if watered, by the force of the water as it issues from the watering-pot.

The best way of growing this delightful annual is to make one or more circular beds of a fine mellow soil, in a conspicuous and sunny situation, and having well watered them with a watering-pot, shortly afterwards sow the seed. Then cover the beds with grass or matting till the seeds germinate, and then remove it. The seed being extremely minute, a pinch of it should be mixed well in a teacupful of dry sand, and sprinkle the mixture by throwing pinch after pinch over the bed; thus it will not be sown unevenly or too thickly. After this, cover with a sprinkling of pure sand, and shelter as above stated.

VARIETIES.

Striata, white flowers, striped and spotted; *Aurea*, deep golden colours, dark throat, very handsome; *Grandiflora*, double, beautiful, variously-coloured flowers of a large size.

SALPIGLOSSIS.

A tall, erect-growing annual of exquisite beauty when in full blossom, with its numerous delicately-pencilled velvety flowers of the size and form of a thimble, and of various shades of colour. It is one of the best for cutting, either for bouquets or for table decoration. The colours of the flowers, which are single, range from golden to purplish crimson, veined and blotched with wonderful tints only to be found in the Salpiglossis. But the great feature of this beautiful genus is that its flowers, when cut, can be kept in water for four or five days, during which period they never lose their freshness or beauty. The dwarf varieties give beautiful flowers, very large, with a magnificent range of colours.

The Salpiglossis likes a rich, light soil. Sow in the spring, and prick out the plants when an inch or so high.

VARIETIES.

S. sinuata, *Variabilis grandiflora*, *Variabilis gr. superbissima*, *V. Nana*.

LOBELIAS.

The tall flowering Lobelias merit a higher place in flower gardens than is allotted to them at present. They are an elegant class of plant, both in style of growth and in the intense shades of colour. Some of the dark-leaved varieties are fine subjects for pot plants. They are free-blooming, hardy annuals, and make good basket plants, edgings, ribbon or carpet bedding, producing a dense carpet of bloom. There are some sixteen varieties in cultivation, yet we see very few of them in our gardens. Sow during autumn and spring. Plants from seed are far the best to grow for bedding purposes, but it requires rather nice management to get up a crop of seedling *Lobelia fulgens*. The seed comes best when sown on the surface of old leaf-mould, and just pressed down without any covering.

VARIETIES.

L. cardinalis: This, although a true Lobelia, is quite distinct from the annual varieties, and is a perennial. Spikes, tall; flowers, cardinal; leaves, bronze. It prefers a cold climate, and should, therefore, succeed in the cooler parts of the State. Emperor William, flowers dark rich blue; White Perfection, pure white; Victoria, a fine scarlet; Royal Purple, dark stalk, flowers deep-blue, with distinct white eyes; Double Blue, in this variety a proportion of the flowers are double.

NASTURTIIUM.

This plant is so common in Queensland that it would seem needless to say much about it here. It is remarkably hardy, and will thrive in any soil without any care or attention. Its many forms are so varied that it possesses a pleasing variety of colour. The number of varieties is very great, producing flowers of a pale-straw colour, orange, scarlet, dark, rich, crimson-brown, and of every intermediate hue, spotted and striped. Dwarf varieties do not grow more than 9 in. high, and form compact bushes, flowering abundantly. They can be transplanted, and should stand 12 in. apart. The tall varieties will spread, or climb 15 ft. Sow in the autumn or spring.

Do not be stingy with the seeds, but plant where there is a place for them; have them in large beds, but do not plant in the shade.

It is a good idea to plant a number of seeds in the vegetable garden for cut flowers. There is nothing prettier than a large bowl of Nasturtiums; then, they are such a cheerful flower.

It is best to plant them in beds on the level with the surrounding surface, as the raised beds dry out so quickly, and I find best, unless one has some special provision for watering them, to have them where so much moisture will not be required.

VARIETIES.

(Dwarf.)

Empress of India, bright scarlet; King Theodore, darkest of all, nearly black; Pearl, flower a clear soft white; Tom Thumb, scarlet and other colours.

(Tall.)

Spitfire, bright scarlet; Regalianum, flowers a beautiful purple-violet; Lobb's Climbers: These may be obtained of many colours, and are very suitable for vases and hanging baskets.

MYROSOTIS.

Universally known and loved for its beautiful little blue, gem-like flowers with golden eye, under the name of "Forget-me-not." It is a perennial plant, but does not thrive well in hot weather. Sown in autumn, it will bloom profusely in spring, covering itself with flowers of the most lovely cerulean-blue.

Being an aquatic, it needs constant watering, and, if grown in a pot, the latter should stand in a pan of water.

VARIETIES.

Palustris, this is the true Forget-me-not, which grows wild in Europe; *Alpestris*, *Stricta Rosea*, flowers pink; Victoria, dwarf, globular habit, sky-blue flowers; *Robusta grandiflora*, a very large flowering species; blooms quickly from seed.

HELIOTROPE,

Sometimes called "Cherry Pie," is a well-known plant of unsurpassed fragrance, suitable for pot or garden culture. It is a tender perennial, and should be sown in a frame and potted off, or planted as soon as the young plants are large enough to handle. Sow during autumn and spring. The Heliotrope, like the Fuchsia and many other plants, may be propagated by cuttings, the tender tips of the shoots being used for preference.

VARIETIES.

Queen Margaret, of dwarf and compact habit, flowers in clusters of a deep dark-blue; Madame de Blonay, flowers white; Beauty of the Boudoir and Miss Nightingale, with mixed sorts, are suitable for bedding out.

CAN PLANTS SEE?

Can plants see as well as think? The opinion of the president of the British Association—Mr. Francis Darwin—that plants can remember and can develop habits has been corroborated by Professor Wager, who proved to the scientists that plants not only can see but can see well. He showed that the outer skins of many leaves are in fact lenses, very much like the eyes of many insects, and quite as capable of forming clear images of surrounding objects. This is the case with most leaves, but especially with those that grow in shade. These lenses are so good and focus the light that falls on them so carefully that photographs can be taken by means of them.

The professor has taken a great many, and he showed some of the more remarkable. They included reproductions of photographs of Darwin and Huxley, in which the features were distinct and unmistakable, as well as direct photographs of landscapes and people. Even coloured photographs were exhibited, and like the rest they were remarkably clearly defined. Not only do these plant-eyes see well, but the rays of light which by means of them are focussed on the interior of the leaf are carried to the brain of the plant and affect the subsequent movements.

It has been long known that the leaves of plants move so that they can get the maximum of light. It is now suggested how this movement is made possible, and the process is almost identical with the movements of animals. A close analysis of the eyes in plants proves them, moreover, to be highly developed organs.

TICK PARASITE.

Officials of the Bureau of Entomology of the United States Department of Agriculture have discovered that certain kinds of stock-infesting ticks in Texas are subject to the attack of an internal parasite, and have signified their willingness to assist in getting this beneficial creature established elsewhere. In its adult stage the parasite (*Ixodiphagus texanus*) is a tiny winged insect, somewhat similar in appearance to the parasites which most commonly affect scale insects. It is not known yet whether or not it attacks the very common cattle tick of Texas, which is closely allied to the so-called Blue Tick of South Africa, but it has been bred from kinds in the same genera as the Dog Tick and the Brown Tick. No other true parasite of ticks has anywhere been discovered.

Apiculture.

The hon. secretary of the Queensland Beekeepers' Association forwards the following items :—

Mr. D. Jones, president of the association, reports :—

"I made several inquiries, when at Roma, regarding the quality of prickly pear honey. Mr. Holloway, the veteran beekeeper of the district, expressed his inability to give an authoritative opinion on the matter, as did also Mr. Wells, who has for a number of years kept bees at Pickanjinie.

"Mr. Wells states that the flowering season for prickly pear is very brief, and he has not a high opinion of the value of the bloom. At Bell, as well as at Pickanjinie, I found beekeepers well pleased with the prospects ahead this season.

"One bee man said that, quite recently, he took over 120 lb. of honey from one hive. Another averred that, from a bee tree growing near Bell he took over 100 lb., and left an equal quantity ungathered. Asked as to why he did not keep bees, he gave the significant answer: 'Why keep bees when the forest is full of them?'

"This speaks well for the locality as a sphere of operations for the prospective apiarist.

"In the Lockyer district, when looking round the lucerne farms, I was much impressed at the great waste of honey, due to the absence of bees to take advantage of the profusion of bloom seen on every side, as each acre in this in bloom at the present time are ironbark and grey and blue gums which for the most part is wasted; this fact speaks for itself as a profitable field of operation to any who will go in for scientific bee culture."

Mr. G. Butler, Waterworks road, reports that his bees are in the best of condition for either comb or extracted honey. The combs in the brood chamber are simply one mass of brood in various stages of development, some of the combs being completely filled with brood from top to bottom. Honey, too, is coming in very freely, and should we be free from hailstorms, or bush fires, during the next few months, a good yield of honey will be assured. The trees in bloom at the present time are ironbark and grey and blue gums, which show a great profusion of flowers.

FLIES IN THE DAIRY.

The "Journal d'Agriculture Pratique" says, it has been found that flies have a great objection to the colour blue, and if tenements infested with flies are washed with a blue instead of a white wash, flies will desert the place. In support of this, an instance is reported by that journal: "A farmer had 170 cows housed in different sheds; they were pestered with flies, but he observed that in one shed, the walls of which were a blue tint, the cows were not worried. He therefore added a blue colour to the lime with which he washed the walls of his buildings, and from that time the flies have deserted his buildings. The following formula is used by him for the wash:—To 20 gallons of water add 10 lb. of slaked lime and 1 lb. of ultramarine. The washing is done twice during the summer." Any remedy, especially such a simple one, is well worth trying in districts where the flies in summer, in this State, are such a serious pest.

Tropical Industries.

THE FUTURE OF THE RUBBER INDUSTRY.

We have received the following very interesting, if somewhat pessimistic, communication from Mr. Cyril E. S. Baxendale, manager of the Jugra Rubber Estate, Selangor, Federated Malay States. No doubt there is much in what Mr. Baxendale says about the possibility of countries such as Queensland, where high rates of wages rule, not being able to compete with other countries where very cheap labour is obtainable. It stands to reason that the profits of planters who pay from 4d. to 10d. per day must be much greater than those of planters who are, by law, compelled to pay as much as 30s. and 35s. per week for white labour, and, from his point of view, Queensland cannot, under such labour conditions, hope to compete with planters in South America, the Straits Settlements, Ceylon, India, Borneo, Java, or Sumatra. We should be pleased if Queensland or New Guinea planters would give us their views on the subject. Rubber-planting is beginning to obtain a footing in this State, and it would be well if the planters interested would take up this question of labour in connection with not only the rubber industry but other tropical industries at present exploited in cheap-labour countries. Mr. Baxendale writes:—

As an old Queenslander I have read with much interest Mr. Howard Newport's "Notes on Rubber in Tropical Australia." Although I have visited North Queensland, I must confess that I am quite ignorant of the labour conditions now prevailing in that territory; but the success of the experiments will mainly depend on the rate of wages that have to be paid for tapping.

The particulars of growth of *Hevea Braziliensis* (Pará rubber) furnished from the Tully and Johnstone Rivers (65 in. in height and 3 in. in girth for the first year—the plants being 18 in. in height, and as thick as a pencil at planting) compare favourably with those recorded from some tropical countries, but are considerably below the average of plantations in this neighbourhood. At that rate of growth the trees should attain a tappable size in eight years, and then yield from 1 to 2 lb. of dry rubber.

Now, let us consider the probable condition of the trade eight years hence. The world's consumption of rubber last year amounted to about 60,000 tons. For several years past—thanks to the development of the motor industry—the annual increase in consumption has averaged about 5,000 tons. Thus, assuming the present prosperity of the trade is maintained, we may expect a demand for 100,000 tons in 1916. This quantity—I estimate on results that I have myself attained—can be produced from 750,000 acres of cultivation, and when this area is exceeded we must expect very much lower prices to prevail. The probable duration of "fat" years can almost be determined by adding together the areas now under this cultivation in Ceylon, Southern India, the Malay States, Borneo, Java, and Sumatra. Figures are not so easily obtained from certain other countries, where the cultivation is progressing, and said to promise success; but, if the present rate of development is maintained, the countries I have named will have fully 750,000 acres under this product within three years. Thus, it is unreasonable to expect more than three years of good prices when the rubber now being planted comes into bearing—even if we choose to ignore the cultivation proceeding in countries outside those above-mentioned, and the prejudices of an important section of the trade against the plantation product.

I know manufacturers who will not touch our rubber at any price, and many more who are convinced that rubber from young trees lacks the tensile strength necessary for some of the most important branches of the trade.

If any one doubts this, let him watch the prices obtained at London auction sales. Buyers admit that my rubber is at least 20 per cent. purer than the average fine Pará rubber—*i.e.*, the product of the wild trees of the Amazon Valley—and two years ago they paid accordingly. To-day my rubber is even cleaner and of better appearance, but I must be content with a very much smaller premium.

I am hopeful that in course of time these prejudices will be generally removed, but I have little doubt that the wild product of the Amazon Valley will be demanded for special purposes for many years to come, and, if necessary, what we shall then consider high prices will be paid for it; while those who are just now beginning to think about planting will find themselves involved in a struggle from which, all other things being equal, only those who can find the cheapest labour will survive.

The rate of pay in South India, Ceylon, and Malay Archipelago ranges from 4d. to 10d. per diem. Can Queensland compete?

In case it may be argued that, as an old grower, I am solely actuated in writing this by the desire to "keep a good thing to myself," I should like to state that I practise what I preach, inasmuch as I ceased planting rubber on this estate some time ago, and have turned my attention to other products, although the profits at present from the rubber I have in bearing are considerably higher than from any other products I can name.

If I may be permitted to advise, I would suggest that your tropical readers should turn their attention to products which have not been the rage for years past. Soil and climate suitable for rubber are generally equally suitable for fibre cultivation. I burnt my fingers with Ramie (Rhea or China Grass), owing to the very limited demand for it; but there are several others, such as *Sansevieria zeylanica* (Bow-string hemp), banana, &c., for which there is a large and expansive market.

COCOA-NUTS.

Cocoa-nut planters in Queensland, New Guinea, the Solomons and other countries and islands in the South Seas, always plant cocoa-nuts near the sea-shore, it having been the established belief that cocoa-nuts grow and thrive best in such localities; but an article was published in the January (1907) issue of the "Journal of the Jamaica Agricultural Society," extracted from the "Bulletin" of the Bureau of Agriculture of the Philippine Islands, which contradicted almost every established belief on cocoa-nut cultivation. We ("Journal of the Jamaica Agricultural Society") then pointed out that there is ever something to learn and ever room for improvement in the methods of growing any crop, so that these ideas were at least worthy of our consideration. The article also pointed out that the application of common salt, especially to light soils, is positively injurious to the cocoa-nut tree. It has been the practice here, where cocoa-nut trees are planted back from the sea to apply salt to the roots of young trees, more especially then is salt put in the hole when the nuts are planted. We all know that cocoa-nuts will grow back from the sea here, and grow well, but the sea breeze sweeps over the whole of our island; in South America and India, however, cocoa-nut trees grow hundreds of miles from the sea, so long as the temperature and soil are suitable. At the same time the cocoa-nut must have originally been a sea-shore loving plant. It is entirely fitted by Nature for such means of transportation, as it floats lightly, and readily sprouts if kept moist, and sends its roots down strongly into the soil it comes in contact with, however sandy and rocky that may be, so long as the rock is loose like coral rock or some of our limestones. Even as doctors disagree, so do expert agriculturists differ apparently, but some of the scientists in connection with the U.S.A. Department of Agriculture, in their energy and zeal are too fond of propounding new theories, and too

ready in recommending the discarding of practices that have stood the test of commercial results. We would rather put faith in the results of investigations where cocoa-nuts have been grown for many centuries, and to such an extent that observations of everything that might affect the trees have been very keen and close, and methods have shown little theory and no sentiment, but every simple practice has been based on what produced the best results under the local conditions.

BOUNTY ON COFFEE.

By the courtesy of Senator T. D. Chataway, we have received a letter addressed to that gentleman by the Assistant Comptroller-General, Department of Trade and Customs, in reply to his request that greater facilities might be afforded to coffee-growers in Queensland in the matter of obtaining the bounty on raw coffee. The following is the letter referred to:—

“Melbourne, 9th October, 1908.

“Senator T. D. Chataway,

“Parliament House, Melbourne.

“DEAR SIR,—Referring to your letter of 26th August last, in which you suggest the desirableness of some arrangement being made by which coffee-planters might, without having to await the results of the hulling process carried out at the factory, receive bounty on the ‘parchment’ coffee sold by them, I am desired by the Minister to state that as the result of inquiries made, it has been decided that when coffee is sold by the grower in the parchment, bounty will be paid on the basis of 100 lb. of parchment coffee yielding 75 lb. of raw coffee.

“Yours faithfully,

“LOCKYER,

“Assistant Comptroller-General.”

[This proportion appears to us to be inequitable, the loss on parchment being about 16 per cent.—Ed. “Q.A.J.”]

SISAL HEMP IN THE BAHAMAS.

From the annual report of the Curator of the Botanical Gardens in the Bahamas (Mr. W. M. Cunningham, formerly of Hope Gardens), we take the following:—

“The export of sisal fibre for the year shows a total value of £40,140. The average selling price of machine and hand cleaned sisal fibre during the financial year was 3½d. per lb. The most important industry is the raising of sisal fibre, used for making binder-twine, ropes, bags, mattings, brushes, &c. Its profits can be judged from the prosperity of the Out Islands. Unaffected by heat, drought, storm, or insects, the sisal crop is certain, and the price is staple. The Bahamas fibre is said to be of superior strength. Its annual yield is variously estimated at from £3 to £10 per acre.

“The estimated area under sisal cultivation is considerably over 25,000 acres. The output exceeds that of previous years, and the acreage is increasing, especially in the Out Islands.

“The enormous trade already existing in sisal, and the increasing demand, with which the production has not yet been able to keep pace, the expansion of the Canadian wheat-growing industry, for which millions of pounds of binder-twine are needed annually, and of late the decrease in the output of Manila fibre, all tend to encourage the planting of sisal.

"Other countries are coming to the front with this sisal fibre industry, which makes it more and more important that no efforts should be spared to bring our product up to the mark in quality. The Hawaiian Islands, Porto Rico, Mexico, and other countries are setting to work with a will to develop a fibre industry; vast quantities of fibre are produced and coming forward for the American market."

A good many years ago a plantation of sisal hemp was established here by Colonel Ward at Moneymusk, but it was given up, owing to the difficulty then of finding effective machinery for dealing with the plant. At the present time, however, there are several machines in the market that are said to be thoroughly effective.

A small plantation has been again set out in Vere, and judging from the confidence in this industry in other parts of the world, we should think it will be very successful. There is talk of another small venture in Trelawny. There are good stretches of land in Jamaica quite suitable for growing sisal. This variety of agave, as well as others, and also Sansevieria, grow wild in the driest parts, and are common. The most suitable soils are light, dry, well-drained, on a limestone foundation, and these are common here, and once the plant is established, no dry weather can kill it out.

This cultivation has made Yucatan, the poorest endowed part of Mexico by Nature, perhaps the richest in actual wealth. The export of fibre from Yucatan is about 600,000 bales, of a value of £3,500,000. The importations into the United States in 1905 amounted to 8,265,819 lb., at an average of £35 per ton. The price per ton, which was £15 0s. 3d. in 1894, has steadily increased every year until now it ranges from £35 to £37 10s. per ton. On dry lands plantations of sisal hemp could be easily and cheaply established, and crops of cotton taken off between the rows when the sisal plants were small.—"Journal of the Jamaica Agricultural Society."

A NEW CANE-CUTTING MACHINE.

For several years inventors have been at work with the object of producing a machine which will not only cut, but also top, the sugar-cane. None have hitherto been successful. Whatever machine has been, or may be, invented for the purpose, it is certain that none will ever work satisfactorily on rough stony land, where, in many cases, the finest cane is grown. Once more an inventor has entered the field, and everyone, whether cane-grower, mill-owner, or general farmer, will heartily wish him success. Mr. W. J. Howcroft, of South Brisbane, is the inventor of a machine which, he claims, will prove that he has overcome all the difficulties which previous inventors have been unable to cope with. As soon as the necessary motors arrive from America, a public demonstration will be given, probably at Bundaberg. The invention, which at present is financed by a local syndicate, has been patented in all sugar-growing countries, as well as in Great Britain. Mr. Howcroft supplies the following information concerning his invention:—

Like an ordinary harvester, the machine runs outside the cane, and the motor power sets in action a series of blades, which are aptly termed "feelers" or "fingers," which, when not in use, can be raised to a height of 18 in. above the ground. When working, these "fingers" are lowered, and seize the cane in the same manner as would be done by a man when cutting. Beneath them are cutting knives, rotating on a lever at high speed—some 400 revolutions per minute. These are so arranged that they can cut the cane an inch or more below the surface of the ground, a most important point, as all sugar-growers know. As soon as the canes are cut, they pass on a movable platform to a man who watches till the canes reach the point at which they would be topped by the human cane-cutter. Then the topping knives, which revolve at the same

speed as the cutters, top each cane at the right point, after which they are delivered on the ground by means of a trough. The tops themselves are passed out separately. The machine is worked by means of two small oil motors.

Should this machine fulfil its inventor's expectations, the cost of cane-cutting will be so reduced—amounting, it is claimed, to a saving of five-sixths of the present cost—that cane-growers will reap an enormous benefit. The machine is expected to cut 150 tons of cane a day, which would mean that a 30-ton crop on 50 acres would be harvested in 10 days. This rapid work, if it be accomplished, will be of incalculable benefit to growers and mill-owners where cane has been heavily frosted, as occurred this year. Thousands of tons of cane could have been saved which became either a partial or total loss, owing to the impossibility of getting the frosted cane off in time, seeing that, at the most, smart cane-cutters can only cut about 3 tons a day, even when working—as many cutters do—as long as 10 and 12 hours a day. In 1907, 94,384 acres of cane were crushed out of a total area planted of 126,810 acres. The weight of cane crushed was 1,665,028 tons. Should this machine fulfil the expectations of the inventor, its value to the sugar industry cannot be over-estimated.

WAX AS A BY-PRODUCT OF SUGAR-CANE.

The "Daily Argosy" (Georgetown), British Guiana, of the 13th June, states that a patent has been applied for with respect to a process for the extraction of wax from the sugar-cane. It seems that the rind of the cane contains a certain proportion of wax, which has hitherto been lost with the refuse. By the new process this wax is now recovered from the filter refuse and turned to commercial uses. It is estimated that 1 ton of cane will yield 0.4 kilo of wax, very similar in its characteristics to bees'-wax or Carnauba wax, and suited to the same purposes for which those waxes are utilised. The wax in question, which resembles that now used very largely for making cylinders for so-called talking machines, is exceedingly hard, and capable of taking a high polish. It is understood that 110 factories in Java will be using this process during the present year.—"Board of Trade Journal," 9th July.

LABOUR AND IRRIGATION ON HAWAIIAN SUGAR-CANE ESTATES.

Reports from the Hawaiian Islands all testify to the fact that the cane crop season of 1907-8 has been a very prosperous one. The crop yields actually obtained have exceeded the estimates, and prices have continued satisfactory through the season. The most recent estimates place the entire sugar crop of the islands at about 500,000 tons, as compared with 390,000 tons in 1906-7.

The Hawaiian correspondent of the "American Sugar Industry and Beet Sugar Gazette" states that the question of the best method of dealing with labourers on the sugar plantations is receiving a good deal of attention in Hawaii. The actual rate of remuneration which the labourers are to receive does not form the question under debate, but it is the manner in which this wage or remuneration shall be paid, so as to be most satisfactory to the labourers themselves, and also result in the most effective cultivation and best returns to plantations, which is under experimental consideration.

As far as the white labourers are concerned, a good deal has been done to make it possible for them to secure homesteads of their own, with a small amount of tillage land attached, so that they will be able to add to their income, or provide part of the provisions required for their family from their own gardens, while working on the plantations for money wages. On one large plantation about seventy families have each been enabled to secure about

5 acres of land from the Government, and these small areas are utilised for the cultivation of pineapples. A pineapple cannery has been built, and the pineapples raised by these small cultivators are purchased at a given rate.

Other plantations have started an arrangement under which a certain specified area of land is given to a group of labourers to be cultivated with sugar-cane, the plantations buying the cane at maturity on a sliding scale of prices varying with the price of sugar. The figure paid for the labourers' canes varies from 2.50 dollars when the price of sugar on the New York market is 3 cents per lb. to 3.50 dollars per ton when sugar in New York is selling at 4 cents per lb.

Irrigation is carried out on a considerable scale on the sugar-cane lands of the Hawaiian Islands, more especially in Maui. In this latter island, various irrigation works which were previously under the direction of different authorities have recently been brought under the control of one corporation. This arrangement should result in less wastage and more efficiency, and should assist towards the further development of the sugar-cane industry of the island.—“Agricultural News,” Barbados.

BRITISH DEMAND FOR QUEENSLAND SISAL FIBRE.

The efforts of those who have so determinedly advocated and put to practical proof the cultivation of the sisal plant in Queensland, combined with the information supplied by the Queensland officials at the Franco-British Exhibition in London, have been successful in drawing the attention of merchants and proprietors of ropeworks, not only in the Commonwealth but also in the United Kingdom, to the possibility of obtaining supplies of fibre from this State. Inquiries as to the prospects of a trade in the article have reached us from Belfast, Aberdeen, and Mannheim-Neckerau, in Germany. The Department of Agriculture and Stock has received an inquiry from Messrs. Mercier and Sinfield, manufacturers' agents, of Luton, Bedfordshire. They write:—

“Your Director, Mr. J. Campbell, has given us your address for our inquiry *re* hemp.

“We are buyers of sisal hemp and all other types of hemp. We have noticed several samples in your exhibits, and would esteem it a great favour to have your samples and prices free London at your earliest convenience. Please state terms, and if you would be able to obtain agency for us. We represent large manufacturers, and have as clients all the leading makers, to whom we could dispose of these goods. . . .”

ESTIMATING WEIGHT OF HAY.

In estimating the weight of hay in a stack by measurement, everything depends on the solidity of the stack. Hay runs from 220 to 320 cubic feet to the ton; the more solid the stack, the fewer the cubic feet required to weigh a ton. Average stuff would run about 270, but judgment is required as to what figure to take. To find the cubic contents of a square-cornered stack, measure the length and breadth about half-way between the bottom and the eaves, allowing about 6 in. for loose hay on the outsides. Then take the height from the bottom to one-third of the distance between the eaves and the ridge, and multiply the length by the breadth, and that total by the height. If all the measurements are in feet, the result will be cubic feet, and that total divided by whichever of the figures given above you select will give the number of tons approximately.

Animal Pathology.

TICK FEVER, OR REDWATER.

By SYDNEY DODD, F.R.C.V.S., Principal Veterinary Surgeon and Bacteriologist.

APPEARANCES AFTER DEATH.

It is necessary to make the examination of an animal as soon after death as possible, as in this country decomposition sets in very rapidly. The appearances of the carcase vary according as to whether the disease is acute or chronic. In the acute cases, where the disease has lasted only a few days, the lungs are swollen and watery; the heart-bag may contain a little blood-coloured fluid, whilst the heart itself may show numerous blood spots or patches. Blood spots may also be seen on the lining of the stomachs. The bowels are inflamed, sometimes so deeply in places as to be almost black; at other times it is slight. The liver is greatly enlarged, and is of a dark-brown colour. The gall bladder is distended with dark, thick, green bile, and its covering has often blood spots on its inner surface. The spleen or melt is always enlarged. It may weigh up to 8 or 10 lb., and when cut into, the pulp appears as a thick, dark mass, like jam. The kidneys are dark and congested. The bladder is usually swollen, and contains dark-coloured urine.

Cases which have lasted some time, usually have a different appearance. The carcase is emaciated, and, on skinning, it has a jaundiced appearance. The muscles are watery and flabby. The spleen is enlarged; the liver yellowish-brown; the bile has flakes of semi-solid material in it; the bladder and the urine may be normal; the kidneys pale and watery; blood spots are usually present on the inner and outer surface of the heart.

It may be as well to mention two diseases that may be mistaken for Tick Fever, especially as stock-owners are, at the present time, very prone to attribute any fatal case of disease among their cattle to Tick Fever, and these are Blackleg and Anthrax.

In Black-leg, however, the disease usually only attacks cattle between the ages of six months and two years. The spleen and liver are unaffected, and there is usually, on some part of the body, a tumour-like swelling, which crackles when the hand is passed over it. If cut into, this has a peculiar smell, something like rancid butter.

With Anthrax, the animal is often found dead with no previous symptoms of illness. There is generally a blood-stained liquid exuding from the natural openings. If the carcase is opened (which should never be done if Anthrax is suspected), the veins under the skin are seen to be distended with blood, and in these and throughout the body, the blood is dark and tarry in appearance. The latter, as a rule, does not clot well. The spleen is almost always greatly enlarged, but the pulp is more liquid than in Redwater. There is intense inflammation of the bowels and fourth stomach, and there is often a good deal of liquid blood in them.

TREATMENT.

Unfortunately, there is little to be said at present as to the curative treatment of Tick Fever. Numberless remedies have been exploited and tried by many persons, but none have as yet stood the test of actual experience over a large number of cases. In many instances, drugs have been credited with doing what Nature would have performed herself unaided by them. There are instances, however, in which the judicious administration of medicine will enable the animal to combat the disease. If the animal is constipated, a drench of 1 lb. of Epsom salts in a quart of warm water or 60 grains of calomel in a little gruel may be given, care being taken in drenching, and the animal handled gently. It is necessary to state that on no account should an

animal be drenched through the nose, as it would probably kill the beast if it happened to go the wrong way. The continual administration of strong purgatives, however, is not to be advised, once the bowels are acting. If the animal appears depressed, one may give $\frac{1}{2}$ -oz. of aromatic spirits of ammonia, or $\frac{1}{4}$ -oz. of carbonate of ammonia, with 1 dram of quinine, in about a quart of water, twice or three times a day. Mix the ammonia with the water first, and then add the quinine. It must be confessed, however, that quinine, although very valuable in cases of human malaria, has very little effect on the Tick Fever organisms.

There is a practice obtaining in certain parts of Queensland of bleeding an animal when suffering from Tick Fever. This I consider to be totally wrong in the light of what we know is going on, for this disease is characterised by more or less destruction of blood cells, and it should be one's endeavour to build the blood up, not to further weaken the animal by abstracting more blood. Good nursing is the great thing with animals suffering from Tick Fever. The animal must be given plenty of good water and fresh green food if it will eat, and also kept quiet and in a shady place. The latter they will generally find themselves if it is obtainable.

As regards what is to be done when Tick Fever breaks out on a farm, the best thing is to dip or spray all the animals that are not too sick, and remove them to clean paddocks. Those which are too sick to be dipped should have all the ticks picked off by hand where practicable, and then put in a place where fresh ticks cannot get on them until they have recovered. A grass-free yard is most suitable. Hand-picking is very laborious, but where only a few cattle are affected, it repays the trouble taken.

When no more cases of illness occur, inoculation can be performed with a minimum amount of risk. The recovered cattle will not need inoculating, as they will have become naturally immune.

PREVENTIVE TREATMENT.

This may be divided into two sections—(1) the prevention of animals becoming infected; (2) the artificial setting up of a mild attack in a beast in order that it may be protected from the more severe, and often fatal, natural infection. With the first heading it may naturally be asked, "How are we to prevent an animal contracting Tick Fever now that the whole coastal country is more or less infested with ticks?" The answer to that is, "Get rid of the cattle tick and you will get rid of Tick Fever." Now, at first sight this seems a very hopeless kind of problem to be set, for it looks like destroying countless millions of ticks over hundreds of miles of land; but, if it is reasoned out a little, it will be seen that it is not such a foolish idea as it looks. We know the life history of the cattle tick, and that it must spend some part of its life on an animal, which is usually an ox or a horse. If this host is not present, the tick must eventually die; therefore, if horses and cattle are kept off a tick-infested paddock, that paddock in course of time—say, twelve months—will become naturally tick free. Then there is the subject of dipping. If ticks are destroyed on an animal, it follows that no eggs can be laid by them, and, consequently, no fresh ticks are hatched out. Not only is regular dipping to be advocated for the purpose of reducing the number of ticks, and so lessening the chances of an animal becoming infected, but also for preventing tick worry, which is a common thing in some parts. There is no need to enlarge upon the loss stock-owners suffer when their cattle are grossly infested with ticks. Animals lose condition, and in dairy herds the loss in milk production is serious. Tanners also inform me that the value of hides is greatly depreciated by ticks. The loss in milk is not to be wondered at when one compares the difference in size between a young larval tick and a fully engorged female, and when one multiplies this by the many hundreds one often finds on an animal it does not require much calculation as to the quantity of blood these pests abstract from a cow, and it must be remembered that this represents highly concentrated food elements that have been elaborated by the animal on which the tick is

feeding, so that the farmer is not only feeding the cow but the tick also. Therefore, regular dipping is to be recommended in all cases; but, as well as dipping, fencing must be insisted on also, for there is a difficulty to be met with. It is no new thing to be informed by farmers that they have been anxious to rid their cattle of ticks, and, therefore, have dipped them regularly until, in some cases, no ticks remained, but the adjoining paddocks belonging to neighbours have been swarming with infected ticks. Somehow, either by a broken fence or some other means, their cattle have got on to the infested ground, or infested cattle have got into their paddock, or, in travelling their stock to other districts, the cattle pick up infected ticks, and the result has been a heavy loss from Tick Fever, owing to their own cattle having lost their immunity. However, this should not discourage an owner from eradicating all the ticks from his land, as he may avoid such loss by inoculating his cattle regularly about every 18 or 24 months, as well as by dipping. In this way he will not only have his cattle tick-free, but also immune from Tick Fever, should infected ticks get on to his land, and, of course, he should see that all new cattle are dipped before being brought on to the paddocks.

The question of tick eradication has only been lightly dwelt on, because the problem is an enormous one, involving considerable expenditure, and public opinion is not yet ripe for such a proceeding. There are many obstacles in the way, too, such as the absence of fences in many places and the presence of scrub cattle. It is well known that on many runs the owner often does not see some of his cattle from one year to another, and there would be great difficulty in dealing with these. Then there is the fact that larval cattle ticks are often spread about mechanically by wild animals—*e.g.*, kangaroos, wallabies, &c.—other than their natural hosts. There is another aspect of the question which is quite familiar to many, and that is, the straying of tick-infested cattle or horses on public roads and lands, and one cannot refrain from remarking that some local authorities in Queensland have not exerted the powers conferred upon them for controlling this undoubted means of spreading ticks. Now, under the Local Authorities Act (section 157), the Minister has the power, at the request of the local authority, to proclaim the tick a pest, and then the local authority can pass by-laws for the eradication of it. As a matter of fact, some local authorities have passed the necessary by-laws, but have taken no steps to enforce them, thus rendering the whole thing a dead letter. Bullock-teams are also very active agents in spreading infected ticks from place to place.

PREVENTIVE INOCULATION.

Preventive inoculation is practised under the following circumstances:—
(1) When fresh stock from an uninfected district are to be introduced into an infected area; (2) when the disease has newly appeared in a district, and it is desired to render all the susceptible cattle immune with the least possible loss.

The term is not strictly correct, because, instead of preventing Tick Fever, one really gives the animal a mild attack of the disease. It is well known that one attack of Tick Fever confers on an animal a great, but not absolute, protection against another attack, and, as previously stated, this knowledge was acted upon by taking blood from an animal that had recovered from the disease and injecting it under the skin of a susceptible animal by means of a syringe. The result was to set up an attack of Tick Fever, but not in so fatal a form as that induced by natural infection; the usual loss from natural tick infection often being from 50 to 90 per cent., whereas that from artificial infection is often under 2 per cent., but sometimes it is a little higher.

A short account is here given of the inoculation carried out under the supervision of the Veterinary Division.

Inoculation of stock for Tick Fever in Queensland was recommenced in September, 1907, it having dropped out of general use since 1900, although a few cattle were occasionally done, chiefly imported stock. No statistics that are of any value are available regarding inoculation carried out at that period.

During the nine months ending July, 1908, a total number of 34,160 head of cattle have been inoculated by the Department. Up to the time of writing, reports have been received on 30,114. Of these, 19,831 were highly susceptible to Tick Fever—that is to say, Tick Fever was present in the district, but had not appeared in any herd to which these cattle belonged; 393 of this number died subsequent to inoculation, giving an average of 1.98 per cent. The remaining 10,283 were partially susceptible—that is, probably some had become immune from natural infection. Of these, 60 died, being an average of 0.58 per cent. So that the average total loss from inoculation among the animals reported on has not been more than about 1.5 per cent.

There are instances, however, where the loss in an individual herd has been greater than this, but on investigation it has usually been found that there have been other factors at work besides the artificial inoculation. For instance, in one locality, out of 221 head inoculated from an untested “bleeder” (this is the common name amongst Queensland stock-owners for an immune animal whose blood is used for inoculation purposes), 20 died; and of 495 inoculated from a tested “bleeder,” 26 died; but in this case Tick Fever was rife in the district, and there is no doubt that a number of these animals were infected by ticks at the time of inoculation, or before they were protected by the latter process. In another district 20 animals were lost out of 158 head inoculated, but here again the animals were dying of Tick Fever at the time of inoculation. In a third case, there were 9 deaths out of 20 head inoculated, but these cattle were inoculated at a certain town and trucked immediately, against advice, to a Redwater district, and here again these animals probably became tick-infested before they were protected by inoculation, besides having their vitality lowered at a critical period by being travelled. These instances are given because there are often wild rumours set about that the Department has inoculated cattle and the owner has, as a result, lost nearly all his herd. On these rumours being investigated, they are found to be without any foundation at all; or, where the loss has been rather heavier than usual, it is because the herd was already infected with Tick Fever, and inoculation cannot cure the disease; or the inoculation has been performed by a private inoculator with an untested “bleeder.”

Of course the number of animals here given does not by any means represent the total number inoculated in the country. With herds numbering from 1,000 upwards, the Department encourages the owners to perform the operation themselves. The figures here given are intended to show that the loss is not great if the inoculation is conducted properly.

As to the best time of the year in which to inoculate, Spring or early Summer is no doubt the best, as the ticks are less numerous, there is plenty of green feed, and the weather is not too hot. Winter in the Northern parts would not be unsuitable, but, unfortunately, at that time of the year, feed is scarce, and cattle might suffer more severely owing to their being in low condition. Mid or late Summer is not a favourable period for inoculation, owing to the heat.

As a result of inoculation, no doubt in dairy herds there is a temporary diminution of the milk supply, but the statement that it also causes all in-calf cows to abort, is apparently not strictly correct. From reports received from dairy herd-keepers there is no doubt a risk of a cow slipping her calf if pregnancy is very far advanced, but, unless this is the case, it does not appear to have a great effect in preventing a cow carrying her calf to full time.

The various sources from which one may obtain blood for inoculation purposes are:—

1. From an animal that has recovered from a natural attack of Tick Fever.
2. From an animal that has been artificially inoculated.
3. From an animal that has been born and reared in a Tick Fever district.

The best method is to obtain blood from an animal that has been inoculated with blood from a known case of Tick Fever and has shown a decided fever reaction.

PREPARATION OF THE ANIMAL TO BE USED FOR BLEEDING PURPOSES.

One or more healthy yearling calves, depending upon the number of stock to be inoculated, should be chosen, if possible, from an uninfected district, and 10 cubic centimetres of blood, obtained from an animal recently recovered from Tick Fever, injected under the skin behind the shoulder by means of a 10 cubic centimetre hypodermic syringe. The calves should then, where practicable, be placed in a sheltered yard or bails, with plenty of green food and water, whilst undergoing the reaction. It is well not to let them run loose in a paddock, as the excitement caused by catching them when required for taking temperatures will often cause their temperatures to go up.

The temperature of each animal should be taken night and morning, commencing on the 6th day until the 26th day. During summer the morning temperature should always be taken as soon as possible after dawn, and the evening one at or after sunset. In the summer, during the heat of the day it is a common occurrence for the temperature of healthy young cattle to vary several degrees.

The temperatures should be entered in a book and kept for reference. Only those animals whose temperatures reach 105 degrees Fahr. or over, should be used for bleeding purposes. From 6 to 10 weeks should be allowed to elapse before any immune animal is used for inoculating.

An animal whose blood is to be used for inoculation purposes should not be bled unless it is in good health. It is well to take the temperature before bleeding, and, if above normal—101.5 degrees Fahr.—the animal should not be used until the fever has subsided. The animal should not be bled at shorter intervals than a fortnight, as too frequent abstraction of blood lowers the animal's vitality, thus enabling the organisms in the blood to multiply. Blood from an animal in such a condition is liable to cause a more severe reaction than it would under normal circumstances.

For the same reason, an animal should not be bled immediately after a long journey, but should be allowed one or two days' rest first.

It should be understood that individual animals vary a great deal in the intensity of the reaction which their blood induces when injected into susceptible animals, the blood from some animals giving a very mild reaction, whilst, on the other hand, others cause such a large mortality as to be unsafe to use for the first inoculation of highly susceptible cattle. It is, therefore, necessary before the blood of any immune animal be used, that it be tested on a few very susceptible animals, aged ones for preference. If the blood be found too virulent, a milder one must be used.

The immune animal giving a mild reaction is the most valuable for bleeding purposes. Its blood, as a rule, causes scarcely any recognisable reaction amongst young stock, except a rise in temperature shown by the clinical thermometer; but it usually causes aged susceptible animals to become visibly ill, though it is rarely fatal. Such blood is invaluable for the inoculation of highly susceptible or aged cattle. In cases where the protection afforded by the mild reaction is not considered sufficient, a much more virulent blood may then be used (allowing the usual time to elapse) with a greater degree of safety.

Another thing to be borne in mind is that the severity of the reaction shown in a "bleeder" is no indication of the reaction its blood will produce in other animals—*e.g.*, a "bleeder" may nearly die through its inoculation, and yet its blood produce a very mild reaction in very susceptible animals. On the other hand, the blood of a "bleeder" which has scarcely reacted may be too virulent to use as a first inoculation.

METHOD OF BLEEDING AN IMMUNE ANIMAL FOR INOCULATION PURPOSES.

When only a small quantity of blood is required, the animal may be tied by the head to a post, a piece of cord or strap placed round the lower part of the neck, as near the chest as possible, and pulled tight in order to make the jugular vein stand out prominently. Then the hair is clipped from over the vein, and the part washed with a solution of a disinfectant, such as cyllin, 1 part in 100 of water, or lysol, 2 parts in 100 of water. The needle of a 10 c.c. hypodermic syringe is then inserted into the vein, and a syringe of blood sucked up. If the blood is injected at once without delay into an animal, it will not have sufficient time to clot, but, if a number of animals are to be inoculated, then measures must be taken to prevent the blood clotting before it is used.

The animal to be bled is thrown on the side most convenient to the operator, and secured by a rope. The head is stretched out; sometimes a block of wood or stone is placed under the neck; the jugular vein is distended by a cord, the hair clipped, and the skin washed as above described. A trocar and canula is then pushed steadily, straight into the skin over the vein about 2 inches in front of the cord, and an endeavour made to pierce the vein. If the skin is very thick, this may be first carefully cut with a sharp knife. As soon as the vein is pierced, the trocar and canula is turned in a slanting direction, so that it points towards the animal's head. The trocar is then withdrawn, leaving the tube or canula in the vein. If the canula has been inserted in the right place, blood will immediately spurt out; if not, the trocar must be replaced, both the trocar and canula withdrawn a little, but not out of the wound, and another endeavour made to find the vein.

When the vein is punctured, the blood is allowed to flow into a clean jug or jar; then, in order to prevent it clotting, it is whipped or stirred vigorously for a few minutes with a few clean wing feathers or twigs (these having been previously placed in a solution of disinfectant for half an hour, and then thoroughly washed in clean boiled water until all trace of disinfectant has been removed). The blood is then strained through a piece of clean muslin into another jug. Another, and more simple way, is to place a little citrate of potash dissolved in water in the vessel in which the blood is being caught. This will prevent the blood clotting without the necessity of stirring it. A teaspoonful of citrate of potash dissolved in about two tablespoonfuls of cold water (previously boiled) will keep a pint of blood fluid. It does not interfere with the reaction of the blood. From a yearling in good condition, from a pint to a pint and a-half of blood may be withdrawn without any risk; from a two-year-old beast, two to three pints; and from three years old and upwards, two to three quarts.

It appears from practical experience, that animals which have been continually used for a period of years for bleeding purposes have gradually ceased to give a satisfactory reaction—that is, the reaction is so mild that it is not sufficient to protect an animal from natural infection. In these cases it is better to prepare a fresh animal rather than endeavour to fortify the blood of the beast which has lost its potency. It should also be remembered that immune animals will lose their immunity in a year or two, and so be useless for inoculation purposes if they are protected from natural tick infection.

INOCULATION OF CATTLE.

Cattle which are used to being handled, such as dairy cattle, may be secured for inoculation by putting a rope over their horns and tying them to a post, or by placing them in a bail. Other cattle will need to be put through a crush. When inoculating, it is convenient to have a small clean bottle to hold a small quantity of blood by which the syringe can be refilled. This bottle can be replenished from the larger vessel from time to time, the latter being covered with a cloth to protect it from flies, dust, &c. The small bottle can be held by an assistant. The operator having filled his syringe with blood approaches the animal, and takes up a loose fold of skin behind

the shoulder between the fingers and thumb of one hand, whilst with the other hand he rapidly inserts the needle in a slanting direction under the skin. The nozzle of the syringe is then inserted into the neck of the needle, the necessary amount of blood injected, and the needle withdrawn—a little rubbing on the spot is useful in order to disperse the blood.

The dose varies from 1 c.c. to 3 c.c.s., according to the virulence of the blood and the age of the animal to be inoculated. As a general rule, however, with blood of moderate virulence the dose usually injected is 3 c.c.s.

For inoculating moderate numbers of cattle, a 10 cubic centimetre hypodermic syringe, graduated in cubic centimetres, is most suitable. It should be such as will permit of its being boiled when the inoculation is finished. Asbestos plungers are better than rubber ones, as the latter soon perish.

When very large numbers of cattle are to be inoculated, a special form of syringe devised by Mr. C. J. Pound has been adopted. The syringe is so arranged by means of tubes and valves that, by simply pulling out the piston of the syringe and pushing it in again, the correct amount of blood is sucked up from a bottle and injected through the needle into the animal, thus obviating the necessity of continually filling the syringe and measuring out the dose.

The method of cleaning this latter apparatus is as follows:—As soon as the inoculation is finished, a quantity of a solution of disinfectant should be pumped through the tubing, &c., until the fluid is no longer bloodstained. The tubing should then be removed, and kept in a vessel covered with a 2 per cent. solution in water of cyllin or lysol. The portions A and B of the double valve, the needle, handle, and syringe may be boiled.

All instruments, &c., except the thermometer, should be well boiled for a few minutes before and after use, and the utmost cleanliness should be observed during the operation. When boiling is impracticable, billy cans, bottles, muslin, &c., used for containing blood should be washed with boiling water before use.

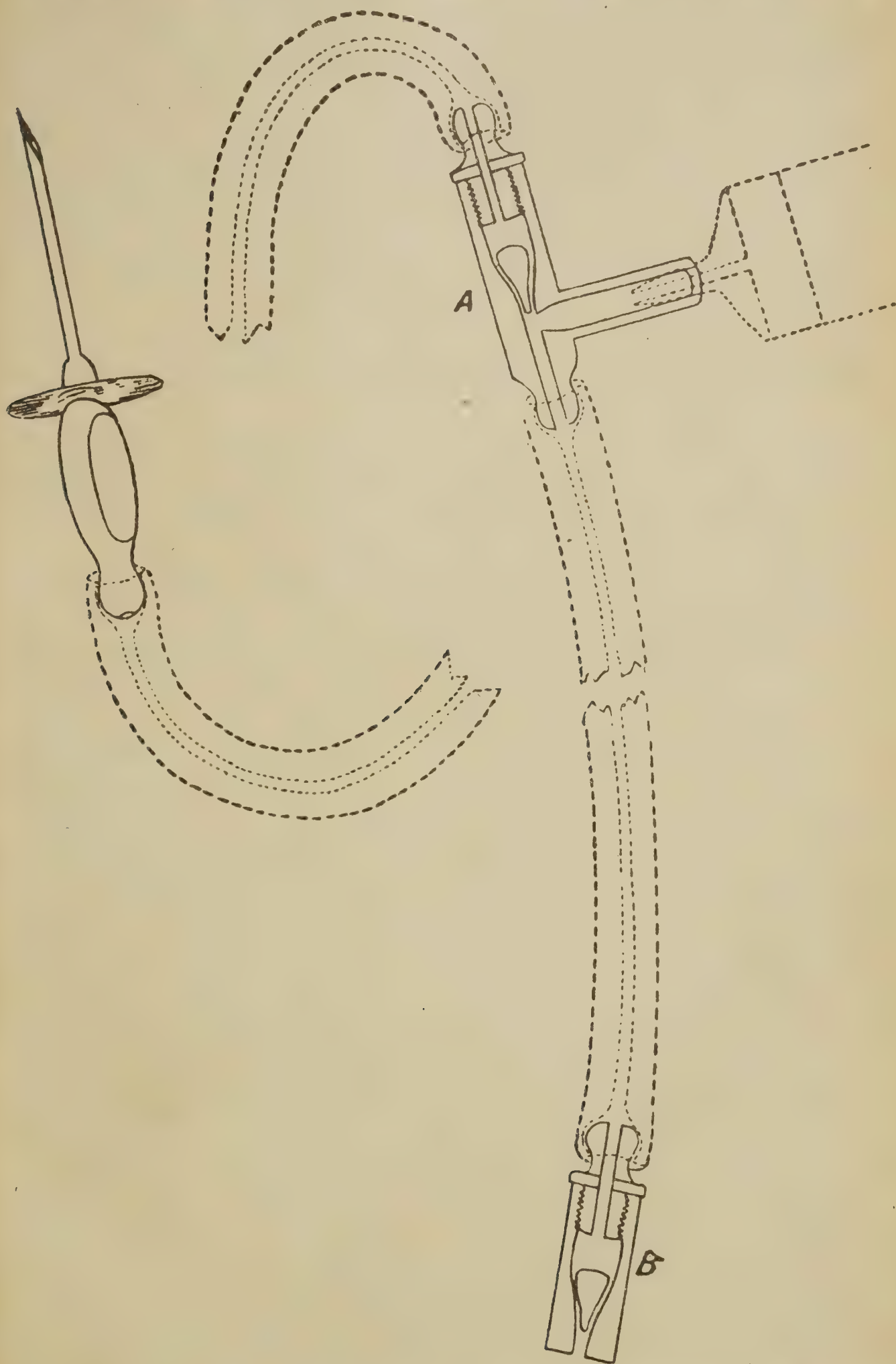
Immediately after inoculation, cattle should, if possible, be placed in a paddock where there is plenty of food, shelter, and water, and should be disturbed as little as possible. Cattle should not be travelled for at least six weeks after inoculation. Any undue exertion while undergoing reaction will often result in heavy loss. A few quiet animals should be picked out of the herd and kept in a small paddock near the crush, for the purpose of taking temperatures, and so checking the reaction.

To ensure a satisfactory result, the blood should be used as soon after it is drawn as possible. Firstly, because the blood loses its virulency after being kept any length of time unless specially prepared; and, secondly, because the blood soon becomes contaminated with bacteria after being drawn, and, if kept long, the result of its use would probably be the formation of an abscess at the seat of inoculation.

If the inoculation has "taken," the result will be a rise of temperature on about the 10th day. It may occur as early as the 6th day, often not until the 14th day. It must be noted that an animal need not necessarily be on the point of death before one decides that it has reacted. Sometimes the reaction is so mild that the animal scarcely shows any visible signs of illness, and, if the owner neglects to take temperatures, he will often conclude that his cattle have not reacted. With mild reactions the temperatures seldom rise above 104 degrees or 105 degrees Fahr. With more severe reactions the temperature reaches from 105 degrees to 107.5 degrees Fahr., and the animal is visibly ill. The high fever may last from 4 to 7 days. In the very severe and fatal cases death generally occurs between 13 and 17 days after inoculation. The remarks as to treatment of cattle naturally infected apply here also. Inoculated cattle must not be kept amongst uninoculated ones if the paddocks are tick infested.

When taking cattle from clean to infected country it is advisable to inoculate them before leaving the clean district. If inoculation is delayed until they reach the infected area, there is great risk of the cattle picking up

infected ticks before immunity is established, and the loss may be severe. If susceptible cattle must be taken into infected country before they are rendered immune, they should be protected from infected tick infestation, as



Sketch showing improved inoculating syringe and position of valves when in use. Reproduced from *Queensland Agricultural Journal*, January, 1908.

far as possible, by being placed in a horse paddock, or in a stable, or a yard where there is no grass, until the reaction from inoculation is over.

All animals do not invariably react at the first inoculation, and those failing to do so should be done a second time. It is, of course, common knowledge that a certain percentage of animals do not give any reaction even when inoculated several times and with very virulent blood. The probable explanation of this is, that the majority of these non-reacting animals have already at some period gone through an attack of Tick Fever, and so become immune. It must also be clearly understood that it is not advisable to inoculate cattle when they have just become naturally infected by ticks and are showing signs of disease, because, as it will be readily perceived, this will only be adding fuel to the fire while they are ill, as besides the natural infection, one would be artificially infecting them at the same time, thus giving the cattle a double dose. In those cases where Tick Fever has broken out on a farm, the measures previously recommended should be adopted, and, when the outbreak has subsided, the remaining cattle which have escaped infection can be protected by inoculation. In several instances where cattle have been inoculated and the resultant losses heavy, on investigation it has been found that the herd was suffering from natural Tick Fever at the time inoculation was performed.

It must also be pointed out that if cattle are subjected to infection by ticks, as is often the case, before the animal is protected by the artificial inoculation, which is usually not earlier than about six weeks from the date of inoculation, the risk of a fatal termination is greatly increased, as it also is if the animals are travelled before the reaction is over.

Then there is the question as to how long immunity lasts in an animal recovered from Tick Fever? The general view now is that immunity does not last so long as used to be thought—that is, of course, provided the animal is not reinfected. If an animal recover from a natural or artificially induced attack of Tick Fever, then all ticks are removed from it, and the beast taken to a clean country where there are no ticks for about two years, or in some cases even only twelve months, and if that animal were taken back into tick country, it would probably contract Tick Fever as readily as any other susceptible animal. There have been cases where a cow has remained immune for ten to thirteen years without being reinfected, but these are exceptions. In a tick country, once the animal recovers, the immunity is kept up by constant tick infection, and therefore, as previously advised, if a man keep his stock tick free in a tick-infested country, he can still protect his cattle by inoculating them every eighteen months or two years. The risk of loss then only lies with those animals which have lost their immunity, and with the young stock there is practically no risk if they are in good health and are inoculated under the age of nine months. It has been proved by practical experience that animals recovered from either natural or artificial infection gain a great amount of protection against subsequent attacks, but, unfortunately, this protection is not proof against everything, and it can be broken down. Animals that have once suffered from Tick Fever may have a second attack, or even a third one, providing their vitality is lowered in any way. This may be brought about by various means, such as travelling stock too long distances without rest, overwork, galloping them about a paddock, over-heating before, and rough handling during dipping, starvation, want of water, or an attack of any other disease, or even if they become heavily infested by the progeny of ticks dropped from another and acute case of Tick Fever. This will explain the many mysterious attacks of Tick Fever which are reported. It should also be remembered that the power of the same organism varies a great deal in different parts, and the immunity which may be quite sufficient in one district may not be strong enough to protect in another. It is a well-known fact both in Queensland and South Africa, that cattle which are immune in one district, have contracted Tick Fever again when removed to

another. This will indicate the advisability of a stock-owner dipping any new cattle before bringing them on to his land, as ticks from another district may introduce a more virulent type of the disease.

Finally, there is the problem as to whether cattle should be inoculated in a district where ticks exist, but no Tick Fever. There is no doubt that inoculation in this case introduces the disease and also keeps it alive, and I do not advocate inoculation in these localities unless the disease has appeared in the neighbourhood ; but under the present circumstances, owing to the movement of cattle, it is only a matter of time before an animal which has recovered from Tick Fever is introduced into the district, as it is not practicable to test every animal before bringing it on to a farm, and then this animal will infect the ticks on the place, and so start a fresh centre of infection.

Statistics.

COMMONWEALTH METEOROLOGY.
RAINFALL OF QUEENSLAND.

TABLE SHOWING THE TOTAL RAINFALL FOR EACH MONTH OF THE YEAR IN THE AGRICULTURAL DISTRICTS OF QUEENSLAND.

STATIONS.	1907.			1908.									
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.
<i>North.</i>													
Bowen	0·06	3·71	6·39	10·14	5·63	9·46	3·73	0·99	0·45	0·88	0·51	0·96	2·47
Cairns	0·68	5·35	28·33	27·02	8·03	20·60	5·99	3·05	0·59	3·70	2·12	0·74	3·07
Geraldton	1·42	6·45	33·82	44·39	13·27	39·00	14·23	18·52	2·64	8·11	3·66	2·81	6·93
Gindie State Farm ...	0·61	1·57	4·42	0·20	7·17	6·25	0·02	0·112	...	0·40	1·27	...	...
Herberton	0·17	3·41	9·57	9·29	5·02	8·92	1·40	0·38	0·31	2·36	Nil	0·51	1·27
Hughenden	1·66	0·66	7·75	0·98	5·18	6·91	0·30	Nil	0·05	0·68	Nil	Nil	1·67
Kamerunga State Nurs.	0·53	2·76	29·82	...	7·47	25·75	4·60	3·363	0·76	4·85	1·58	...	3·64
Mackay	0·12	5·76	9·70	9·28	3·83	17·43	14·82	3·25	1·29	1·65	0·71	2·27	1·80
Rockhampton	0·47	3·72	4·42	3·84	9·64	9·77	2·62	0·85	0·10	1·08	0·84	0·20	2·14
Townsville	0·03	2·82	24·26	12·21	6·69	9·03	0·38	2·22	Nil	1·70	0·27	0·28	1·58
<i>South.</i>													
Biggenden State Farm	1·99	2·50	5·55	2·37	9·82	9·84	2·97	0·74	0·43	0·49	2·33	1·39	1·80
Brisbane	1·37	4·25	3·21	2·80	8·43	18·19	2·45	2·40	0·17	0·77	2·83	0·67	1·77
Bundaberg	1·70	2·90	2·99	4·77	2·82	7·35	4·13	0·67	0·39	0·75	1·56	1·10	2·39
Dalby	0·69	5·18	1·44	0·17	4·88	7·61	0·11	0·37	0·63	0·14	1·80	1·13	2·55
Esk	0·50	3·76	3·72	2·61	10·06	17·04	2·83	1·07	0·23	0·46	2·75	2·16	1·29
Gatton Agric. College	0·71	3·01	4·55	...	3·38	10·74	...	0·10	0·16	0·6	2·71	1·84	1·93
Gympie	1·20	3·05	5·49	6·26	11·77	8·09	1·87	2·00	0·38	1·16	2·87	1·37	2·49
Ipswich	0·78	4·45	3·40	1·32	6·63	13·77	2·71	1·14	0·12	0·47	3·23	1·19	1·48
Maryborough	2·74	3·49	5·81	5·62	8·07	11·40	2·52	1·05	0·46	0·81	1·98	1·05	1·84
Roma	1·04	3·70	2·51	0·04	6·38	2·51	0·22	Nil	0·55	0·63	1·38	1·12	2·15
Roma State Farm ...	...	...	...	...	...	...	...	...	...	1·27	0·73	...	...
Tewantin	1·05	3·12	7·36	10·42	12·47	14·39	7·59	8·66	0·75	1·97	2·70	2·18	2·30
Warwick	1·37	3·25	3·13	0·76	4·52	6·65	1·40	0·15	0·80	1·24	2·99	1·96	0·96
Westbrook State Farm	1·08	4·76	3·23	0·43	8·03	1·41	1·40	00·5	...	0·49	1·97	...	...
Yandina	1·44	2·87	3·05	8·37	14·47	16·62	5·45	4·59	0·58	2·64	2·18	1·50	3·10

NOTE.—The rainfall data in this table are compiled from telegraphic reports, and must be considered as approximate only.

GEORGE G. BOND,
Divisional Officer.

ESK PASTORAL, AGRICULTURAL, AND INDUSTRIAL ASSOCIATION.

The next Annual Show of the above Society will be held on 4th May, 1909.

General Notes.

SPROUTED SEED POTATOES.

Three or four years ago, it was conclusively proved at the Queensland Agricultural College that seed potatoes which have been sprouted before planting, have come up more evenly, and have given better returns than seed which had not sprouted before sowing. The following item gives evidence of this:—Trials with respect to sprouted *v.* unsprouted seed potatoes were carried out for the Irish Department at sixty-seven centres in sixteen countries, the potatoes sprouted in boxes being for the main crop of late varieties. There was an average increase of 2 tons per acre from sprouting, and in every country the average showed more or less of an increase. In the four preceding seasons the increase due to sprouting has ranged from 1 ton 13 cwt. to 2 tons 13 cwt. No stronger testimony could be desired.

NEW ZEALAND HEMP INDUSTRY.

Speaking of the prospects of the hemp industry to a "News" representative lately, Mr. W. H. O. Johnson, the Government grader at Auckland, adopted a somewhat pessimistic tone. "Unless the price improves," he said, "I do not think that more than 25 per cent. of the millers will start operations—they cannot be expected to start if there is no prospect of a profit."

Asked whether there was any likelihood of an improvement, Mr. Johnson said the position entirely depended on the state of the Manila market; while the output was very large, the price was exceedingly low. On the other hand, if the price of Manila should rise, the manufacturers would at once turn to the New Zealand article. "Manila," said the expert, "can be much more cheaply put on the market, owing to the cheap labour that is available there. Although the Manila requires more handling, the low cost of production gives the millers there the advantage over local producers. Then Manila is a better fibre, and at a lower price is naturally sought after."

"Very little hemp is coming to hand," continued Mr. Johnson, "and it strikes me that many of the flax areas in this province will be the better for a year's rest. The only millers who will continue operations this year are those who are situated close to a railway or to steamers, and who can afford to put hemp on the market at a low price."

SOUTH BURNETT A. P. AND I. SOCIETY.

We are advised that the date of the next Kingaroy Annual Show has been fixed for Wednesday and Thursday, 28th and 29th April, 1909.

BIGGENDEN AGRICULTURAL AND PASTORAL SOCIETY.

The next Annual Show of the above society will be held on Thursday and Friday, 1st and 2nd July, 1909.

COCOA-NUTS IN CEYLON.

The area under cocoa-nut palms in Ceylon reaches about 680,000 acres, chiefly in gardens and plantations owned by natives. Tea comes next in importance as regards the area planted—viz., 390,000 acres. There are 34,000 acres under cacao, and about 120,000 acres planted with rubber. The rubber plantations are owned almost entirely by Europeans.

Answers to Correspondents.

AILING HORSE.

"BUNDA," Bundaberg—

The probability is, that your horse is suffering from some defect of his back teeth or molars. Mr. Sydney Dodd, Chief Veterinary Surgeon to the Department of Agriculture and Stock, recommends that you obtain the services of a practical man to examine the horse's teeth, and apply the necessary treatment, which consists of rasping the sharp edges off them, and then feeding the animal on soft food for a day or two.

TROUBLE AFTER CALVING.

E. DOSSEL, Mimerambi—

Your question was referred to Mr. Sydney Dodd, Principal Veterinary Surgeon, and his memorandum in reply was forwarded to you by the Under Secretary for Agriculture and Stock. The details are too long for insertion here.

DESTROYING BANDICOOTS.

A. MOSER, Aloomba—

The only remedies against bandicoots are shooting, trapping, poisoning by means of baits, such as sweet potatoes and strychnine, and wire-netting. A couple of sharp fox-terriers are also useful in keeping down the pests. A good bandicoot trap is figured in the Journal, Vol. XVIII., page 93 (February).

MANURING TOMATOES.

"BEGINNER," Mooloolah.—

A rich sandy loam, well drained and deeply ploughed, is the best for tomato culture. Tomatoes will not stand heavy manuring after the fruit has set, because either farmyard manure or other stimulating fertilisers delay the development and ripening of the fruit. A good manure is made up as follows:— 2 parts nitrate of soda, 2 parts of bone meal, 3 parts of kainit, 4 parts of superphosphate. Apply 1 oz. per square yard of soil weekly, slightly covering it. Apply from the time the plants are established until the fruit has set. The superphosphate has been found to hasten the maturing of the fruit.

BROOM MILLET.

BROOM MILLET, Bell.—

The so-called suckers should be removed by snapping them off at the point where they junction with the main stem, after they attain a length of from 9 to 12 inches. Bending down the heads is done for several reasons, one of which is to prevent twisted "hurl," but it must be understood that many heads will not require it. It is usually done when the seed head has left its protecting sheath and the seed has just formed. Leave 6 to 8 inches of stalk below the base of the fibre, and then with a deft movement of the thumb and finger turn the head gently over, care being taken not to snap it off. The seed, as it fills, will help to keep the fibre straight.

TOMATO CASE.

"ENGINEER."—

There is no regulation size for tomato cases in this State. The dimensions here given are those of the case which is most acceptable to the trade.

PINE CASE.

Twenty-eight inches long, outside measurement; ends, 6 inches deep; same width—or, in other words, 6 by 6, with a 6 by 6 centre piece. Top of the case should be in one piece.

"YOUNG DAIRYMAN," COOROO.—

Your communication arrived after we had gone to Press. It will be published in the January issue of the Journal.

Times of Sunrise and Sunset at Brisbane, 1908.

DATE.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.3	5.34	5.29	5.47	4.58	6.5	4.46	6.28	4 Sept. (First Quarter 6 51 a.m.
2	6.2	5.34	5.28	5.48	4.57	6.6	4.46	6.29	10 " O Full Moon 10 23 p.m.
3	6.1	5.35	5.27	5.48	4.57	6.7	4.46	6.29	17 " D Last Quarter 8 33 "
4	5.59	5.35	5.25	5.49	4.56	6.8	4.46	6.30	26 " ● New Moon 0 59 a.m.
5	5.58	5.35	5.24	5.49	4.55	6.8	4.46	6.31	
6	5.57	5.36	5.23	5.50	4.55	6.9	4.46	6.32	
7	5.56	5.36	5.22	5.50	4.54	6.10	4.46	6.32	3 Oct. (First Quarter 4 14 p.m.
8	5.55	5.37	5.21	5.51	4.53	6.10	4.46	6.33	10 " O Full Moon 7 3 a.m.
9	5.54	5.37	5.20	5.51	4.53	6.11	4.46	6.34	17 " D Last Quarter 1 35 p.m.
10	5.53	5.38	5.19	5.52	4.52	6.12	4.47	6.35	25 " ● New Moon 4 47 "
11	5.52	5.38	5.18	5.52	4.52	6.13	4.47	6.35	
12	5.51	5.39	5.17	5.53	4.51	6.13	4.47	6.36	
13	5.49	5.39	5.16	5.54	4.51	6.14	4.47	6.36	
14	5.48	5.39	5.15	5.54	4.50	6.15	4.48	6.37	2 Nov. (First Quarter 0 16 a.m.
15	5.47	5.40	5.13	5.55	4.50	6.16	4.48	6.38	8 " O Full Moon 5 58 p.m.
16	5.46	5.40	5.12	5.55	4.49	6.16	4.48	6.38	16 " D Last Quarter 9 41 a.m.
17	5.45	5.41	5.11	5.56	4.48	6.17	4.49	6.39	24 " ● New Moon 7 53 "
18	5.43	5.41	5.10	5.56	4.48	6.18	4.49	6.40	
19	5.42	5.42	5.9	5.57	4.48	6.19	4.49	6.40	
20	5.41	5.42	5.9	5.58	4.48	6.20	4.50	6.41	1 Dec. (First Quarter 7 44 a.m.
21	5.40	5.43	5.8	5.58	4.47	6.20	4.50	6.41	8 " O Full Moon 7 44 "
22	5.39	5.43	5.7	5.59	4.47	6.21	4.51	6.42	16 " D Last Quarter 7 12 "
23	5.38	5.44	5.6	5.59	4.47	6.22	4.51	6.42	23 " ● New Moon 9 50 p.m.
24	5.37	5.44	5.5	6.0	4.47	6.23	4.52	6.43	30 " (First Quarter 3 40 "
25	5.35	5.44	5.4	6.1	4.46	6.23	4.53	6.43	
26	5.34	5.45	5.3	6.1	4.46	6.24	4.53	6.44	
27	5.33	5.45	5.2	6.2	4.46	6.25	4.54	6.44	
28	5.32	5.46	5.1	6.3	4.46	6.26	4.54	6.44	
29	5.31	5.46	5.1	6.3	4.46	6.26	4.55	6.45	
30	5.30	5.47	5.0	6.4	4.46	6.27	4.55	6.45	
31	...	...	4.59	6.5	...	...	4.56	6.46	

The Markets.

PRICES FOR FRUIT—ROMA-STREET MARKETS.

Article.	OCTOBER.
	Prices.
Apples, per case	...
Apples (Hobart), per case	6s. to 11s.
Apples (American), per case	...
Asparagus (Westbrook State Farm), per dozen bundles	...
Bananas (Cavendish), per dozen	3d. to 3½d.
Bananas (sugar)	1½d. to 2½d.
Custard Apples, per case	...
Gooseberries, per quarter-case	...
Lemons, per case	5s. to 7s.
Lemons, rough, per case	...
Loquats (Sydney), per case	...
Mandarins, per case	8s. to 12s.
Mangoes, per case	...
Oranges, per case	7s. 6d. to 9s.
Passion Fruit, per quarter-case	4s. to 6s.
Papaw Apples, per quarter-case	2s. 6d. to 3s. 6d.
Persimmons, per case	2s. 6d. to 5s.
Pineapples (Ripley's), per dozen	4s. to 9s. 6d.
Pineapples, rough, per dozen	6d. to 5s.
Pineapples, smooth, per dozen	5s. 6d. to 10s. 6d.
Rosellas, per sugar bag	...
Strawberries, per dozen boxes	4s. to 10s.
Tomatoes, per quarter-case	1s. 6d. to 5s.
Tomatoes (spotted), per quarter-case	...
Tomatoes (prime), per quarter-case	...

SOUTHERN FRUIT MARKET.

Apples (Hobart) per case	10s. to 10s. 6d.
Apples, American, per case	10s. to 15s.
Apples, Baldwins, per case	14s.
Apricots, per box	5s. to 7s.
Bananas, Queensland, per bunch	3s. 6d. to 5s. 6d.
Bananas, Queensland, per case	14s. 6d. to 15s.
Cherries, per 12-lb. box	9s. to 12s.
Lemons, per case	12s.
Loquats, per case	5s.
Mandarins (Local), per case	16s.
Mandarins, Emperor, per case	...
Oranges (Local), per case	12s.
Oranges, Navel, per case	15s.
Passion Fruit, per quarter-case	7s.
Passion Fruit (medium), per case	...
Passion Fruit (small), per case	...
Peaches, China, per case	5s. to 7s.
Pears, American, per half-box	7s. to 7s. 6d.
Pineapples (common), choice, per case	9s. to 11s.
Pineapples (common), good, per case	7s. to 8s. 6d.
Pineapples (Ripley Queen), per case	9s. to 11s.
Pineapples (Queen's), per case	9s. to 11s.
Strawberries (small and inferior), per three-quart tray	...
Tomatoes, Queensland, choice (coloured), per quarter-case	6s. to 7s.
Tomatoes, good, per quarter-case	...
Tomatoes, small	...

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR NOVEMBER.

Article.							NOVEMBER.
							Prices.
Bacon, Pineapple ...	...	...	...	...	...	lb.	9d. to 10d.
Barley, Malting ...	...	...	...	...	...	"	...
Bran ...	...	...	...	...	...	ton	£5 10s. to £6.
Butter, Factory ...	...	...	...	...	...	lb.	11½d. to 1s.
Chaff, Mixed ...	...	...	...	...	...	ton	£5 10s.
Chaff, Oaten ...	...	...	...	...	...	"	£6 to £6 5s.
Chaff, Lucerne ...	...	...	...	...	...	"	£3 15s. to £6 5s.
Chaff, Wheaten ...	...	...	...	...	...	"	£4 10s. to £5 10s.
Cheese ...	...	...	...	...	...	lb.	7½d. to 8d.
Flour ...	...	...	...	...	...	ton	£9 15s. to £10
Hay, Oaten ...	...	...	...	...	...	"	£9
Hay, Lucerne ...	...	...	...	...	...	"	£3 to £4 5s.
Honey ...	...	...	...	...	...	lb.	2¼d. to 2½d.
Maize ...	...	...	...	...	...	bush.	4s. 4½d. to 4s. 6d.
Oats ...	...	...	...	...	...	"	...
Pollard ...	...	...	...	...	...	ton	£6 10s.
Potatoes ...	...	...	...	...	...	"	£8 to £12 10s.
Potatoes, Sweet ...	...	...	...	...	...	"	...
Pumpkins ...	...	...	...	...	...	"	...
Wheat, Milling ...	...	...	...	...	...	bush.	4s. 11d.
Wheat, Chick ...	...	...	...	...	...	"	4s. 11d.
Onions ...	...	...	...	...	...	ton	£9 to £14 10s.
Hams ...	...	...	...	...	...	lb.	10½d. to 1s. 1½d.
Eggs ...	...	...	...	...	...	doz.	7½d. to 9½d.
Fowls ...	...	...	...	...	...	pair	3s. 6d. to 5s.
Geese ...	...	...	...	...	...	"	6s. 6d. to 7s. 8d.
Ducks, English ...	...	...	...	...	...	"	4s. 9d. to 5s. 6d.
Ducks, Muscovy ...	...	...	...	...	...	"	5s. 6d. to 6s. 4d.
Turkeys (Hens) ...	...	...	...	...	...	"	8s. 6d. to 9s. 6d.
Turkeys (Gobblers) ...	...	...	...	...	...	"	19s. to 23s.

ENOGGERA SALEYARDS.

Animal.							OCTOBER.
							Prices.
Bullocks ...	...	...	...	...	...	...	£8 12s. 6d. to £11
" (single) ...	...	...	...	...	...	...	£12 10s.
Cows ...	...	...	...	...	...	...	£8 2s. 6d. to £9 2s. 6d.
" (single) ...	...	...	...	...	...	...	£10 10s.
Merino Wethers ...	...	...	...	...	...	...	20s.
C.B. " ...	...	...	...	...	...	...	22s. 6d.
Merino Ewes ...	...	...	...	...	...	...	16s. 9d.
C.B. " ...	...	...	...	...	...	...	18s. 9d.
Lambs ...	...	...	...	...	...	...	15s. 6d.
Pigs (bacon) ...	...	...	...	...	...	...	46s.
Pigs (slips) ...	...	...	...	...	...	...	10s.

Orchard Notes for January.

By ALBERT H. BENSON, M.R.A.C.

THE SOUTHERN COAST DISTRICTS.

The fruit of the month in this part of the State is the grape, and its gathering and marketing will occupy the attention of growers. Care should be taken to cut the fruit when cool and dry, and if it has to be sent any distance the stems of the bunches should be allowed to wilt before the fruit is packed, as the berries will thus hang on to the bunch better, and the bunch carry in better order. Select the fruit carefully, grade it, and pack firmly so that it will not bruise in transit. If to be sent long distances, pack in crates holding from four to six 6-lb. baskets. Pines will be ripening in quantity towards the end of the month. Gather before fully coloured, and, whether for Southern or local markets, pack and handle carefully to prevent bruising. Do not ship the fruit too green for the Southern markets, as doing so is apt to spoil the trade. Send good fruit to the canneries. Small pines and crippled fruit are no good to canners, and the sooner our growers realise that it only pays to grow good fruit the better for them and for the canners, as if the latter cannot get good fruit it is impossible for them to put a line of goods that will not only be a credit to the State, but for which a world-wide market can be obtained.

Passion fruit should not be allowed to lie about for days on the ground before gathering, as if so they are apt to become fly-infested.

Water melons and rock melons are still in season.

Watch any late peaches, Japanese plum, or other fruits liable to be infested with the fruit fly, and gather and destroy all infested fruit, or, better still, grub the trees out and burn them, as they only breed flies to destroy more valuable fruit. Mangoes will be ripening during the month. See that all fly-infested fruits are destroyed, as they will only breed up further crops to destroy later ripening fruits.

Citrus orchards can be cyanided during the month for scale insects, and spraying for Maori with the sulphide of soda wash should be continued where necessary.

Mangoes can be budded during the month as well as citrus and deciduous trees. Tropical fruit trees can be transplanted, taking care to choose dull weather and to cover same from the direct rays of the sun till they have become firmly established. Pines and bananas can still be planted.

TROPICAL COAST DISTRICTS.

See that all bananas are covered with netting, as the fly is usually at its worst at this time of year.

Mangoes will be going off. See that they are not allowed to remain about on the ground to breed flies for the Autumn crop of oranges. Longan, litchi, and other fruit are in season. As the month is often a very wet one, little cultivation can be done in the orchards. Strong undergrowth should, however, be kept down with a hoe or scythe. Tropical fruits of all sorts can be planted. Look out for Maori on citrus fruits, and spray when necessary.

SOUTHERN AND CENTRAL TABLELANDS.

January is a busy month in the Stanthorpe district, apples, pears, plums, peaches, and nectarines being in season. Do not gather the fruit too immature, at the same time do not allow it to be over-ripe. Gather dry, handle carefully, grade and pack in attractive cases. Keep the fruit as cool as possible,

and ship in well-ventilated cars. Keep a sharp look-out for fruit fly, and take every possible means to prevent its spreading, even going so far as to gather and destroy the whole of the fruit on any infested trees, as if kept in check during the month the bulk of the fruit ripening during February will be free.

Keep a sharp look-out also for codling moth, examine the bandages on the trees at least every ten days, and destroy all larvæ found therein, also gather and destroy all moth-infested fruit.

Gather Bartlett pears as soon as they are large enough, and store away in a cool shed to ripen; when they show signs of ripening, market, not before. If sent down green they will sell for cooking, and only fetch a small price. The right stage at which to gather is when the fruit is fully developed, and the flesh has lost its woody flavour but is still quite hard. This is usually before the fly has stung it, and if gathered at this stage the fruit will ripen up properly without shrivelling and develop its full flavour.

These remarks apply also to the Downs country, which is somewhat earlier than Stanthorpe.

The crop of the month in the Western tablelands is the grape; and the remarks I have made respecting this fruit when grown in the Southern Coast Districts apply equally here. The fruit should be gathered dry, and wilted before it is packed. Too large cases are often used, cases holding from 20 to 30 lb., or crates holding six 6-lb. baskets are preferable; the latter being the best package for shipping the fruit long distances. Keep the orchards well cultivated, and, when water for irrigation is available, give citrus trees a watering during the month, unless there has been a sufficient rainfall. When the orchard is irrigated, see that thorough cultivation follows the irrigation, so as to conserve the moisture in the soil.

Red Scale, which is prevalent on citrus fruits in the dry Western country, should be treated during the month. Cyaniding is the best remedy.

Farm and Garden Notes for January.

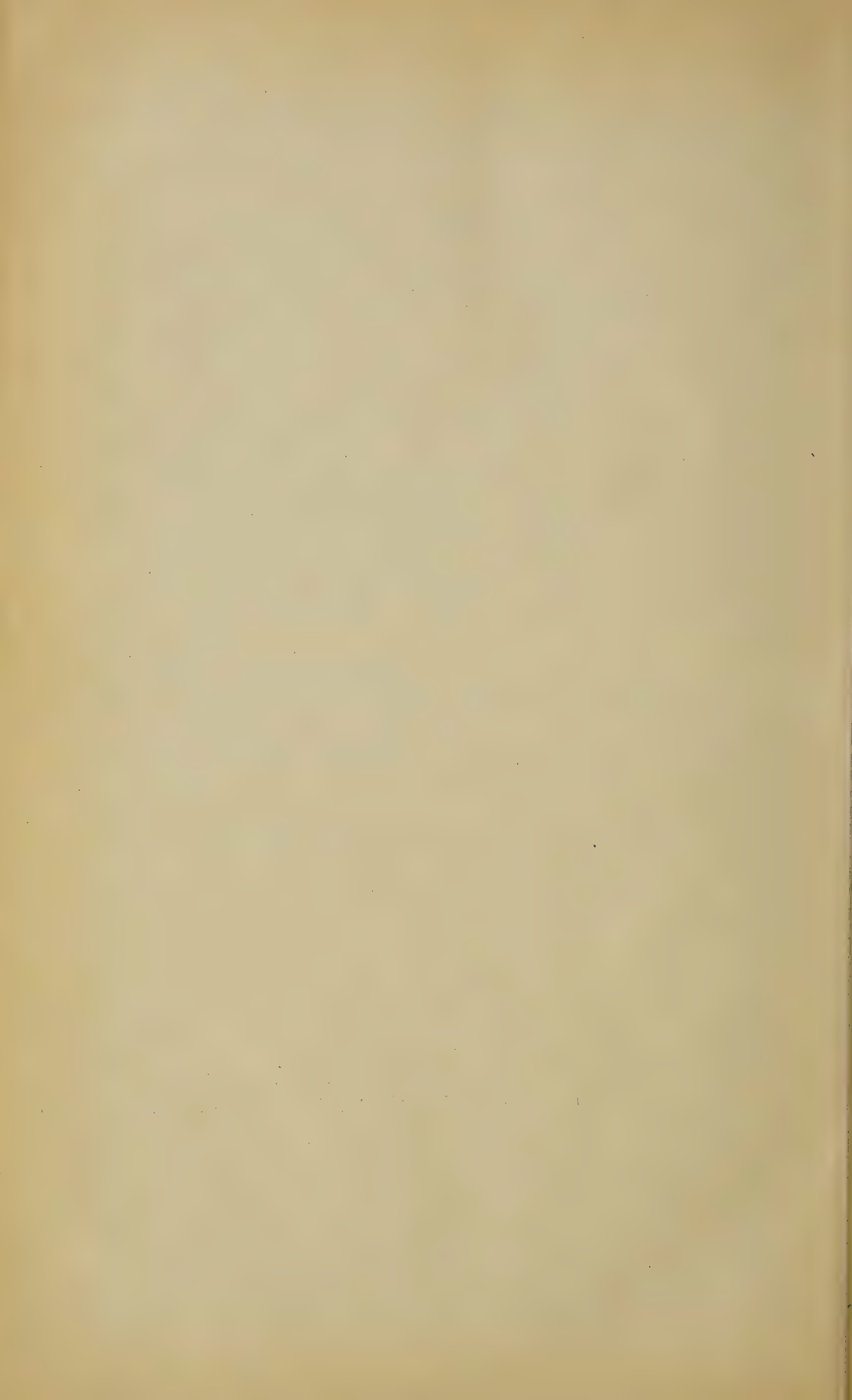
FIELD.—The main business of the field during this month will be ploughing and preparing the land for the potato and other future crops, and keeping all growing crops clean. Never allow weeds to seed. This may be unavoidable in the event of long-continued heavy rains, but every effort should be made to prevent the weeds coming to maturity. A little maize may still be sown for a late crop. Sow sorghum, imphee, Cape barley, vetches, panicum, teosinte, rye, and cowpeas. In some very early localities potatoes may be sown, but there is considerable risk in sowing during this month, and it may be looked upon merely as an experiment. Plant potatoes whole.

KITCHEN GARDEN.—A first sowing of cabbages, cauliflower, and Brussels sprouts may now be made in a covered seed bed, which must be well watered and carefully protected from insect pests. Sow in narrow shallow drills; they will thus grow more sturdy, and will be easier to transplant than if they were sown broadcast. The main points to be attended to in this early sowing are shading and watering. Give the beds a good soaking every evening. Mulching and a slight dressing of salt will be found of great benefit. Mulch may consist of stable litter, straw, grass, or dead leaves. Dig over all unoccupied land, and turn under all green refuse, as this forms a valuable manure. Turn over the heavy land, breaking the lumps roughly to improve the texture of the soil by exposure to the sun, wind, and rain. In favourable weather sow

French beans, cress, cauliflowers, mustard, cabbage, celery, radish, for Autumn and Winter use. Sow celery in shallow, well-drained boxes or in small beds, which must be shaded till the plants are well up. Parsley may be sown in the same manner. Turnips, carrots, peas, and endive may also be sown, as well as a few cucumber and melon seeds for a late crop. The latter are, however, unlikely to succeed except in very favourable situations. Transplant any cabbages or cauliflowers which may be ready. We do not, however, advise such early planting of these vegetables, because the fly is most troublesome in February. For preference, we should defer sowing until March. Still, as "the early bird catches the worm," it is advisable to try and be first in the field with all vegetables, as prices then rule high. Cucumbers, melons, and marrows will be in full bearing, and all fruit as it ripens should be gathered, whether wanted or not, as the productiveness of the vines is decreased by the ripe fruit being left on them. Gather herbs for drying, also garlic, onions, and eschallots, as the tops lie down.

FLOWER GARDEN.—To make the flower beds gay and attractive during the Autumn and Winter months is not a matter of great difficulty. Prepare a few shallow boxes. Make a compost, a great part of which should consist of rotten leaves. Fill the boxes with the compost, then sow thinly the seeds of annuals. Keep the surface of the soil moist, and when the young seedlings are large enough to handle lift them gently one by one, with a knife or a zinc label—*never pull them up by hand*, as, by so doing, the tender rootlets are broken, and little soil will adhere to the roots. Then prick them out into beds or boxes of very light soil containing plenty of leaf-mould. Then keep a sharp lookout for slugs and caterpillars. Keep a supply of tobacco dust on hand, and scatter this in the path of the slug, and he will cease from troubling you.

All kinds of shrubby plants may be propagated by cuttings. Thus, pelargoniums, crotons, coleus, and many kinds of tropical foliage plants can be obtained from cuttings made this month. After putting out cuttings in a propagating frame, shade them with a piece of calico stretched over it. Be careful not to over-water at this season. Propagate verbenas, not forgetting to include the large scarlet Foxhunter. Verbenas require rich soil. Palms may be planted out this month. If the weather prove dry, shade all trees planted out. With seed boxes, mulch, shade, water, and kerosene spray, all of which imply a certain amount of morning and evening work. The flower garden in Autumn and Winter will present a charming sight, and will afford light and profitable work for girls with spare time on their hands.



LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	7 Feb.	11 and 12 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Barron Valley Agricultural, Pastoral, and Industrial Association	G. Bardon ...	24 and 25 July	
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	A. Winship ...	1 May	
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	20 Sept.	3 and 4 Sept.
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	24 and 25 July	9 and 10 July
Blackall ...	Barcoo Pastoral Society ...	...	28 and 29 May	
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	C. E. Mackenzie ...	27 and 28 June	13 and 14 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine) ...	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	H. J. Johnson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	Charles A. Arvier	13, 14, 15, 16, and 17 Aug.	10, 11, 12, 13, 14, & 15 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruitgrowers' Association	G. O. Burnett ...		
Buderim Mt. ...	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...	29 and 30 May	
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	Thos. W. Walker		
Burpengary ...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Alloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	J. Reid ...	5 and 6 Sept.	20 and 21 July
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		
Cairns ...	Hambledon Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—continued.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...	14 and 15 May	
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	18 and 19 June	
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	A. Eastaughffe ...	12, 13, and 14 June	
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ...		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...	31 Aug.	
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...		
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	...	8 June
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ...	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	30 April	26 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	James Scanlan ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	25 and 26 June	9 and 10 June
Gayndah ...	Reid's Creek Farmers' Progress Association	George Sutherland		
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	J. R. Hamilton ...	15 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Canegrowers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...	23 Jan.	
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...	3 and 4 April	
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...	21 and 22 Aug.	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ..		
Gympie ...	Gympie Horticultural Society ...	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharry, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Withcott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway	1 April	
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden ...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...	...	14 and 15 Aug.
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson		
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	17 Oct.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...	19, 20, and 21 June	
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	...	29 and 30 Aug.	10 and 11 June
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	C. C. Ridley ...		
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...	6 and 7 May	
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	Sept.	24 June
Ma Ma Creek, via Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	4 and 5 June	17 and 18 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruckshank ...	3 and 4 June	
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	22, 23, and 24 May	24, 25, and 26 June
Miriam Vale	Miriam Vale Farmers' Association	J. Spencer ...		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	C. J. Wyer ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—continued.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Mooloolah ...	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	25 and 26 April	
Nanango ...	North Barker's Creek Farmers' Association	A. Becker ...		
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. J. Cooper ...	18 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	...	10 and 11 July
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...		
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz ...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	30 Jan.	29 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...	August (Date not fixed)	
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	20, 21, and 22 June	11, 12, and 13 June
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson	16 and 17 July	
Roma ...	Yingerbay Farmers' Association ...	R. Frederick ...		
Roma (Blythdale)	Warooby Farmers' Association ...	Geo. Munt...		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ...	Farmers' Club ...	P. H. Adams ...	29 and 30 May	15 and 16 July
Southport ...	Southport Horticultural Society ...	E. Fass ...		
Springure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springure ...	The Springure Pastoral and Agricultural Society	H. E. Laver ...		30 April
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	21 and 22 Feb.	20 and 21 Feb.

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...	7 and 8 May	
Sydney ...	Royal Agricultural Society of New South Wales	...	7, 8, 9, and 10 Aug.	
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	S. E. Tooth ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ..		
Tingoora ...	Tingoora Farmers' Progress Association	Arthur Boisen ...	6, 7, 8, and 9 Aug.	
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...	2 and 3 July	
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	12, 13, and 14 Feb.	
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	Victor Drury ...	18 Sept.	
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloongabba	Queensland Dairy Herdbook Society	Alfred Gorrie ...		
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	...	15 and 16 July
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ..		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yingerbay ...	United Farmers' Association of the Maranoa	R. Frederich ...		
Zillmere ...	Zillmere Horticultural Society	E. H. Decker ...		

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1907.

Number of meetings held by the Society during 1907.

Date of the last meeting.

Name of the Secretary for 1908.

Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos. Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

"QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.

DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,
Principal Veterinary Surgeon and Bacteriologist.

QUEENSLAND AGRICULTURAL COLLEGE.
FOR SALE.

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. BOARS, 2 GUINEAS; SOWS, 1 GUINEA each; f.o.b. Gatton.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.
Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in June or July of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from sixteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Sixteen Years.

HERMITAGE STATE FARM.

FOR SALE.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Full particulars on application to THE MANAGER, State Farm, Hermitage.

STATE FARM, WESTBROOK.

GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, before 25th JULY, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

CANARY GRASS

(*Phalaris commutata*).

This is the best all-the-year-round grass as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlings: Two SHILLINGS AND SIXPENCE per Dozen, or TWELVE SHILLINGS per 100.

Seed is now ready for distribution. Price, £1 1s. per lb., or 1s. and 2s. 6d. packet, Post Free.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets and Freight.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE

—:0:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam (<i>Ficus elastica</i>) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber (<i>Hevea braziliensis</i>) } * ...	Plants ...	" " ...	3d. each
" " " " } ...	Seed ...	Feb. to April	1s. per oz. (about 1 doz.
Central American (<i>Castilloa elastica</i>) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
" " " " ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber (<i>Funtumia elastica</i>) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber (<i>Manihot Glaziovii</i>) ..	Seed only	" , ...	1s. per oz. (about 50)
West African Rubber (<i>Tabernaemontana</i>) ...	Plants ...	" " ...	6d. each, 5s. per doz.
" " " (<i>Crassa</i>) ...	Seed ...	" " ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.o.b. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.

CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.

2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.

3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.

4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,
Brisbane, 6th August, 1907.

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,
Westminster Chambers, Victoria street, London, S.W.

“THE QUEENSLAND FLORA”

BY F. MANSON BAILEY, F.L.S.,

Colonial Botanist of Queensland.

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

IN SIX PARTS, OF BETWEEN 300 AND 400 PAGES EACH, ROYAL OCTAVO

Price, £1 10s. for Complete Work.

Obtainable at the DEPARTMENT of AGRICULTURE and STOCK.

CLEARING LAND.

**TREWHELLA BROS.' PATENT JACKS ARE
UNSURPASSED FOR THIS WORK.**

THE
MONKEY JACK

Is Specially Designed for
Heavier Stump-grubbing
and Tree-extracting.



THE
WALLABY JACK

Is Specially Designed for
Lighter Stump-grubbing
and Tree-extracting.

**GIVES ONE MAN MORE THAN THE POWER OF TEN.
SAVES ITS COST EASILY WITHIN THREE MONTHS.**

Inquire Particulars of Leading Ironmongers and Storekeepers; or Send for Catalogues to

A. ROBINSON,
55 ADELAIDE STREET, BRISBANE.—(Queensland Depot.)

IMPORTS OF FRUIT, Etc., INTO VICTORIA.

The following Regulations relating to the importation of fruit, plants, trees, &c., into the State of Victoria have been promulgated by the Victorian Minister for Agriculture:—

1. Inspectors are authorised and required to charge the following fees and expenses for examining citrus fruits imported, introduced, or brought into Victoria:—

For each case or package not exceeding one bushel in capacity, One halfpenny.

The inspection fee for bananas is now 1d. per bunch or case.

For each case or package exceeding one bushel in capacity, One penny.

2. Such fees and expenses shall be paid by the owner or the person in possession to the inspector.

IMPORTATION OF FRUIT OR PLANTS INTO NEW ZEALAND.

(Extract from the "New Zealand Gazette" of 27th February, 1908.)

By an Order in Council, gazetted on the 20th February, 1908, the New Zealand Government have revoked all previous Proclamations and Orders in Council, dated respectively from 6th July, 1897, to 22nd January, 1908, referring to the importations into New Zealand of grape vines—rooted and cuttings—fruit infested with Queensland fruit fly, scale-infested plants and fruit, or with apple scab or black spot, or potatoes infested with Irish blight, or potato moth.

The new regulations declare that the only ports of entry for fruit or plants are—for fruit only, Bluff; for fruit and plants, Auckland, Wellington, Christchurch, Dunedin. They also provide for the inspection of fruit on arrival at the above ports, and for fumigation or destruction of shipments unaccompanied by a certificate signed by the shipper, and another signed by an officer of the Department of Agriculture of the State where the fruit was grown, certifying that the fruit is clean and free from disease. Full particulars will be found by anyone interested in shipping fruit to New Zealand in the "New Zealand Gazette" of 27th February, 1908.

LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	7 Feb.	11 and 12 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Barron Valley Agricultural, Pastoral, and Industrial Association	G. Bardon ...	24 and 25 July	
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	A. Winship ...	1 May	
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	20 Sept.	3 and 4 Sept.
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	24 and 25 July	9 and 10 July
Blackall ...	Barcoo Pastoral Society ...	...	28 and 29 May	
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	C. E. Mackenzie ...	27 and 28 June	13 and 14 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine) ...	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	H. J. Johnson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	Charles A. Arvier	13, 14, 15, 16, and 17 Aug.	10, 11, 12, 13, 14, & 15 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruit-growers' Association	G. O. Burnett ...		
Buderim Mt. ...	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...	29 and 30 May	
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary ...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	J. Reid ...	5 and 6 Sept.	20 and 21 July
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		
Cairns ...	Hambleton Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...	14 and 15 May	
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	18 and 19 June	
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	A. Eastaughffe ...	12, 13, and 14 June	
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ...		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...	31 Aug.	
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...		
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	...	8 June
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ...	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	30 April	26 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ...		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	25 and 26 June	9 and 10 June
Gayndah ...	Reid's Creek Farmers' Progress Association	P. A. Fortescue ...		
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	J. R. Hamilton ...	15 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Cane-growers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...	23 Jan.	
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...	3 and 4 April	
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...	21 and 22 Aug.	
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ..		
Gympie ...	Gympie Horticultural Society	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharry, junr. ...		
Headington Hill	Queensland Farmers' Association	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Withcott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club	A. Campbell ...		
Herbert River	Macknade Farmers' Association	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association	D. G. Scott ...		
Herbert River	United Farmers' Association	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway	1 April	
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...	...	14 and 15 Aug.
Ingham ...	Stone River Farmers' Association	W. B. G. Johnson		
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	17 Oct.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...	19, 20, and 21 June	
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Kingaroy ...	Kingaroy Farmer's Association	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	...	29 and 30 Aug.	10 and 11 June
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association	C. C. Ridley ...		
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...	6 and 7 May	
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	Sept.	24 June
Ma Ma Creek, via Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	4 and 5 June	17 and 18 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruickshank ...	3 and 4 June	
Maryborough	Maryborough Horticultural Society	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	22, 23, and 24 May	24, 25, and 26 June
Miriam Vale	Miriam Vale Farmers' Association	J. Spencer ...		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	C. J. Wyer ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Mooloolah ...	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelipa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	25 and 26 April	
Nanango ...	North Barker's Creek Farmers' Association	A. Becker ...		
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. J. Cooper ...	9 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	...	10 and 11 July
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...		
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	30 Jan.	29 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...	August (Date not fixed)	
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	20, 21, and 22 June	11, 12, and 13 June
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson	16 and 17 July	
Roma ...	Yingerbay Farmers' Association	R. Frederick ...		
Roma (Blythdale)	Warooby Farmers' Association	Geo. Munt...		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ...	Farmers' Club	P. H. Adams ...	29 and 30 May	15 and 16 July
Southport ...	Southport Horticultural Society	E. Fass ...		
Springsure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springsure ...	The Springsure Pastoral and Agricultural Society	H. E. Laver ...		30 April
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	21 and 22 Feb.	20 and 21 Feb.

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...	7 and 8 May	
Sydney ...	Royal Agricultural Society of New South Wales	...	7, 8, 9, and 10 Aug.	
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	S. E. Tooth ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...		
Tingoora ...	Tingoora Farmers' Progress Association	Arthur Boisen ...	6, 7, 8, and 9 Aug.	
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...	2 and 3 July	
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	12, 13, and 14 Feb.	
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	Victor Drury ...	18 Sept.	
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloom-gabba	Queensland Dairy Herdbook Society	Alfred Gorrie ...		
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	...	15 and 16 July
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yingerbay ...	United Farmers' Association of the Maranoa	R. Frederich ...		
Zillmere ...	Zillmere Horticultural Society ...	E. H. Decker ...		

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1907.

Number of meetings held by the Society during 1907.

Date of the last meeting.

Name of the Secretary for 1908.

Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos. Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

"QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.

DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,
Principal Veterinary Surgeon and Bacteriologist.

QUEENSLAND AGRICULTURAL COLLEGE. FOR SALE.

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. BOARS, 2 GUINEAS; SOWS, 1 GUINEA each; f.o.b. Gatton.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.
Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in June or July of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from sixteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Sixteen Years.

HERMITAGE STATE FARM.

FOR SALE.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Full particulars on application to THE MANAGER, State Farm, Hermitage.

STATE FARM, WESTBROOK.

GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, before 25th JULY, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

CANARY GRASS

(*Phalaris commutata*).

This is the best all-the-year-round grass as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlings: Two SHILLINGS AND SIXPENCE per Dozen, or TWELVE SHILLINGS per 100.

Seed is now ready for distribution. Price, £1 1s. per lb., or 1s. and 2s. 6d packet, Post Free.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets and Freight.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam (<i>Ficus elastica</i>) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber (<i>Hevea braziliensis</i>) } ...	Plants ...	" " ...	3d. each
" " " " } *	Seed ...	Feb. to April	1s. per oz. (about 1 doz.)
Central American (<i>Castilloa elastica</i>) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
" " " " ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber (<i>Funtumia elastica</i>) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber (<i>Manihot Glaziovii</i>) ..	Seed only	, , ...	1s. per oz. (about 50)
West African Rubber (<i>Tabernaemontana</i>) ...	Plants ...	" " ...	6d. each, 5s. per doz.
" " " (<i>Crassa</i>) ...	Seed ...	" " ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.o.b. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.

CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.
2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.
3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.
4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,
Brisbane, 6th August, 1907.

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,
Westminster Chambers, Victoria street, London, S.W.

“THE QUEENSLAND FLORA”

BY F. MANSON BAILEY, F.L.S.,

Colonial Botanist of Queensland.

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

IN SIX PARTS, OF BETWEEN 300 AND 400 PAGES EACH, ROYAL OCTAVO

Price, £1 10s. for Complete Work.

Obtainable at the DEPARTMENT of AGRICULTURE and STOCK.

COMMONWEALTH OF AUSTRALIA.

Customs and Excise Office,

Brisbane, 4th July, 1908.

COMMERCE ACT, 1905.

Export Regulations.

CIRCULAR.]

Delays by Exporters in furnishing the necessary Certificates under the *Commerce (Trade Descriptions) Act*, 1905, have recently occurred, and in some cases it has been stated that their neglect to conform with the Regulations in this matter was caused by difficulty in getting the Certificates issued in time.

2. The Department of Agriculture and Stock has now appointed an Officer to deal specially with the issue of Certificates, and this will obviate delays of the nature referred to.

3. Exporters are to see that in future Certificates are presented in all cases at the time of shipment of goods (except leather, regarding which special arrangements are made).

W. H. IRVING,

Collector of Customs.

IMPORTS OF FRUIT, ETC., INTO VICTORIA.

The following Regulations relating to the importation of fruit, plants, trees, &c., into the State of Victoria have been promulgated by the Victorian Minister for Agriculture:—

1. Inspectors are authorised and required to charge the following fees and expenses for examining citrus fruits imported, introduced, or brought into Victoria:—

For each case or package not exceeding one bushel in capacity, One halfpenny.

The inspection fee for bananas is now 1d. per bunch or case.

For each case or package exceeding one bushel in capacity, One penny.

2. Such fees and expenses shall be paid by the owner or the person in possession to the inspector.

IMPORTATION OF FRUIT OR PLANTS INTO NEW ZEALAND.

(Extract from the "New Zealand Gazette" of 27th February, 1908.)

By an Order in Council, gazetted on the 20th February, 1908, the New Zealand Government have revoked all previous Proclamations and Orders in Council, dated respectively from 6th July, 1897, to 22nd January, 1908, referring to the importations into New Zealand of grape vines—rooted and cuttings—fruit infested with Queensland fruit fly, scale-infested plants and fruit, or with apple scab or black spot, or potatoes infested with Irish blight, or potato moth.

The new regulations declare that the only ports of entry for fruit or plants are—for fruit only, Bluff; for fruit and plants, Auckland, Wellington, Christchurch, Dunedin. They also provide for the inspection of fruit on arrival at the above ports, and for fumigation or destruction of shipments unaccompanied by a certificate signed by the shipper, and another signed by an officer of the Department of Agriculture of the State where the fruit was grown, certifying that the fruit is clean and free from disease. Full particulars will be found by anyone interested in shipping fruit to New Zealand in the "New Zealand Gazette" of 27th February, 1908.

CLEARING LAND.

TREWHELLA BROS.' PATENT JACKS ARE
UNSURPASSED FOR THIS WORK.

THE
MONKEY JACK

Is Specially Designed for
Heavier Stump-grubbing
and Tree-extracting.



THE
WALLABY JACK

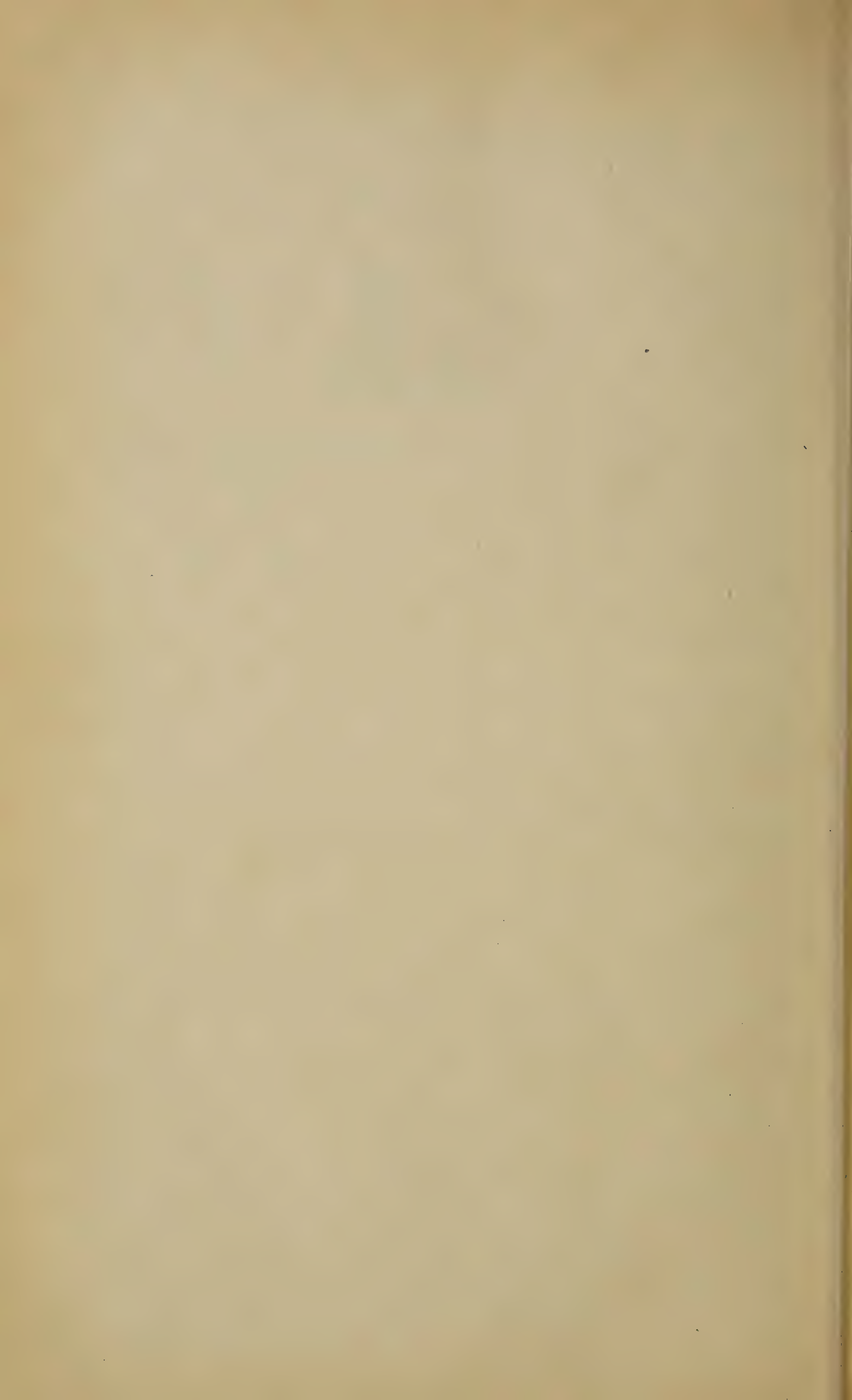
Is Specially Designed for
Lighter Stump-grubbing
and Tree-extracting.

GIVES ONE MAN MORE THAN THE POWER OF TEN
SAVES ITS COST EASILY WITHIN THREE MONTHS.

Inquire Particulars of Leading Ironmongers and Storekeepers ; or Send for Catalogues to

A. ROBINSON,
55 ADELAIDE STREET, BRISBANE. — (Queensland Depot.)

By Authority : GEORGE ARTHUR VAUGHAN, Government Printer, William street, Brisbane.



LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	7 Feb.	11 and 12 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Barron Valley Agricultural, Pastoral, and Industrial Association	G. Bardon ...	24 and 25 July	
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	A. Winship ...	1 May	
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	20 Sept.	3 and 4 Sept.
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	24 and 25 July	9 and 10 July
Blackall ...	Barcoo Pastoral Society ...	...	28 and 29 May	
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	C. E. Mackenzie ...	27 and 28 June	13 and 14 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine) ...	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	H. J. Johnson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	Charles A. Arvier	13, 14, 15, 16, and 17 Aug.	10, 11, 12, 13, 14, & 15 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruitgrowers' Association	G. O. Burnett ...		
Buderim Mt. ...	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...	29 and 30 May	
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary ...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	J. Reid ...	5 and 6 Sept.	20 and 21 July
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		
Cairns ...	Hambleton Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Cedar Pocket, <i>via</i> Gympie Charleville ...	Cedar Pocket Farmers' Progress Association	Samuel Eriksen ...		
Charters Towers	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...	14 and 15 May	
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	18 and 19 June	
Childers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers	Isis Agricultural Association ...	H. Epps ...		
Childers	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers	Childers Pastoral, Agricultural, and Industrial Society	A. Eastaughffe ...	12, 13, and 14 June	
Childers	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Laysley ..		
Cleveland	Cleveland Horticultural Society ...	Miles R. Fox ...	31 Aug.	
Clifton	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...		
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...		8 June
Cooyar	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Dugandan	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	30 April	26 May
Eudlo	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ...		
Gayndah	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	25 and 26 June	9 and 10 June
Gayndah	Reid's Creek Farmers' Progress Association	P. A. Fortescue ...		
Geraldton	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin	Currajong and Gin Gin Agricultural and Pastoral Society	J. R. Hamilton ...	15 June	3 June
Gladstone	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Cane-growers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...	23 Jan.	
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...	3 and 4 April	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...	21 and 22 Aug.	
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ...		
Gympie ...	Gympie Horticultural Society ...	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharpy, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Withcott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway	1 April	
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden ...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...	...	14 and 15 Aug.
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson		
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	17 Oct.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...	19, 20, and 21 June	
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	...	29 and 30 Aug.	10 and 11 June
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	C. C. Ridley ...		
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...	6 and 7 May	
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	Sept.	24 June
Ma Ma Creek, via Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	4 and 5 June	17 and 18 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruckshank ...	3 and 4 June	
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	22, 23, and 24 May	24, 25, and 26 June
Miriam Vale	Miriam Vale Farmers' Association	J. Spencer ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	C. J. Wyer ...		
Mooloolah ..	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	25 and 26 April	
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. J. Cooper ...	9 Oct.	
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	...	10 and 11 July
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...		
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz ...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel senr.	30 Jan.	29 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...	August (Date not fixed)	
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	20, 21, and 22 June	11, 12, and 13 June
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson	16 and 17 July	
Roma ...	Yingerbay Farmers' Association ...	R. Frederick ...		
Roma (Blythedale)	Warrooby Farmers' Association ...	Geo. Munt...		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ...	Farmers' Club ...	P. H. Adams ...	29 and 30 May	15 and 16 July
Southport ...	Southport Horticultural Society ...	E. Fass ...		
Springure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springure ...	The Springure Pastoral and Agricultural Society	H. E. Laver ...	...	30 April

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	21 and 22 Feb.	20 and 21 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...	7 and 8 May	
Sydney ...	Royal Agricultural Society of New South Wales	...	7, 8, 9, and 10 Aug.	
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	S. E. Tooth ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...		
Tingoorra ...	Tingoorra Farmers' Progress Association	Jas. McKenzie ...	6, 7, 8, and 9 Aug.	
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...	2 and 3 July	
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	12, 13, and 14 Feb.	
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...	18 Sept.	
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloongabba	Queensland Dairy Herdbook Society	Alfred Gorrie ...		
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	...	15 and 16 July
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yingerbay ...	United Farmers' Association of the Maranoa	R. Frederich ...		
Zillmere ...	Zillmere Horticultural Society	E. H. Decker ...		

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1907.

Number of meetings held by the Society during 1907.

Date of the last meeting.

Name of the Secretary for 1908.

Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

"QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.

DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,
Principal Veterinary Surgeon and Bacteriologist.

QUEENSLAND AGRICULTURAL COLLEGE.
FOR SALE.

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. BOARS, 2 GUINEAS; SOWS, 1 GUINEA each; f.o.b. Gatton.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.
Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in June or July of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from sixteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Sixteen Years.

HERMITAGE STATE FARM.

FOR SALE.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Full particulars on application to THE MANAGER, State Farm, Hermitage.

STATE FARM, WESTBROOK.

GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlets: ONE SHILLING AND THREEPENCE per Dozen, or SEVEN SHILLINGS AND SIXPENCE per 100, f.o.b.

Seed is now ready for distribution. Price, 12s. 6d. per lb., or 1s. per packet, Post Free.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets and Freight.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam (<i>Ficus elastica</i>) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber (<i>Hevea braziliensis</i>) } ...	Plants ...	" " ...	3d. each
" " " " } ...	Seed ...	Feb. to April	1s. per oz. (about 1 doz.
Central American (<i>Castilloa elastica</i>) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
" " " " ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber (<i>Funtumia elastica</i>) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber (<i>Manihot Glaziovii</i>) ..	Seed only	, , ...	1s. per oz. (about 50)
West African Rubber (<i>Tabernaemontana</i>) ...	Plants ...	" " ...	6d. each, 5s. per doz.
" " " (<i>Crassa</i>) ...	Seed ...	" " ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.o.b. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department import in quantity from Singapore or elsewhere. See conditions attached.

CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.
2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.
3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.
4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,
Brisbane, 6th August, 1907.

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15
St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of
the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,
Westminster Chambers, Victoria street, London, S.W.

“THE QUEENSLAND FLORA”

By F. MANSON BAILEY, F.L.S.,

Colonial Botanist of Queensland.

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

IN SIX PARTS, OF BETWEEN 300 AND 400 PAGES EACH, ROYAL OCTAVO.

Price, £1 10s. for Complete Work.

Obtainable at the DEPARTMENT of AGRICULTURE and STOCK.

COMMONWEALTH OF AUSTRALIA.

Customs and Excise Office,

Brisbane, 4th July, 1908.

COMMERCE ACT, 1905.

Export Regulations.

CIRCULAR.]

Delays by Exporters in furnishing the necessary Certificates under the *Commerce (Trade Descriptions) Act*, 1905, have recently occurred, and in some cases it has been stated that their neglect to conform with the Regulations in this matter was caused by difficulty in getting the Certificates issued in time.

2. The Department of Agriculture and Stock has now appointed an Officer to deal specially with the issue of Certificates, and this will obviate delays of the nature referred to.

3. Exporters are to see that in future Certificates are presented in all cases at the time of shipment of goods (except leather, regarding which special arrangements are made).

W. H. IRVING,

Collector of Customs.

IMPORTS OF FRUIT, ETC., INTO VICTORIA.

The following Regulations relating to the importation of fruit, plants, trees, &c., into the State of Victoria have been promulgated by the Victorian Minister for Agriculture:—

1. Inspectors are authorised and required to charge the following fees and expenses for examining citrus fruits imported, introduced, or brought into Victoria:—

For each case or package not exceeding one bushel in capacity, One halfpenny.

The inspection fee for bananas is now 1d. per bunch or case.

For each case or package exceeding one bushel in capacity, One penny.

2. Such fees and expenses shall be paid by the owner or the person in possession to the inspector.

IMPORTATION OF FRUIT OR PLANTS INTO NEW ZEALAND.

(Extract from the "New Zealand Gazette" of 27th February, 1908.)

By an Order in Council, gazetted on the 20th February, 1908, the New Zealand Government have revoked all previous Proclamations and Orders in Council, dated respectively from 6th July, 1897, to 22nd January, 1908, referring to the importations into New Zealand of grape vines—rooted and cuttings—fruit infested with Queensland fruit fly, scale-infested plants and fruit, or with apple scab or black spot, or potatoes infested with Irish blight, or potato moth.

The new regulations declare that the only ports of entry for fruit or plants are—for fruit only, Bluff; for fruit and plants, Auckland, Wellington, Christchurch, Dunedin. They also provide for the inspection of fruit on arrival at the above ports, and for fumigation or destruction of shipments unaccompanied by a certificate signed by the shipper, and another signed by an officer of the Department of Agriculture of the State where the fruit was grown, certifying that the fruit is clean and free from disease. Full particulars will be found by anyone interested in shipping fruit to New Zealand in the "New Zealand Gazette" of 27th February, 1908.

CLEARING LAND.

TREWHELLA BROS.' PATENT JACKS ARE
UNSURPASSED FOR THIS WORK.

THE
MONKEY JACK

Is Specially Designed for
Heavier Stump-grubbing
and Tree-extracting.



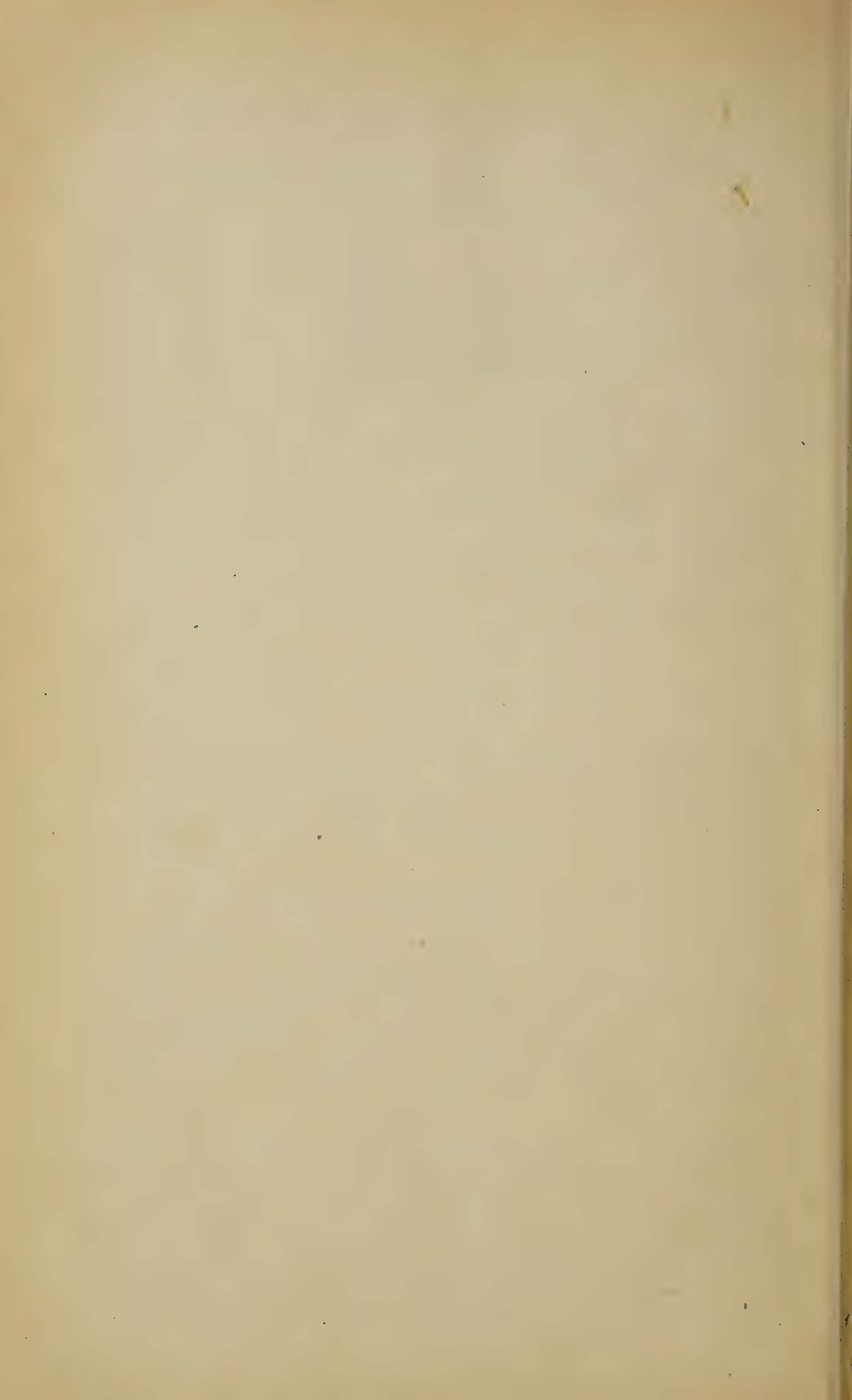
THE
WALLABY JACK

Is Specially Designed for
Lighter Stump-grubbing
and Tree-extracting.

GIVES ONE MAN MORE THAN THE POWER OF TEN
SAVES ITS COST EASILY WITHIN THREE MONTHS.

Inquire Particulars of Leading Ironmongers and Storekeepers ; or Send for Catalogues to

A. ROBINSON,
55 ADELAIDE STREET, BRISBANE. — (Queensland Depot.)



LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	7 Feb.	11 and 12 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Barron Valley Agricultural, Pastoral, and Industrial Association	G. Bardon ...	24 and 25 July	
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	A. Winship ...	1 May	
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	20 Sept.	3 and 4 Sept.
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	24 and 25 July	9 and 10 July
Blackall ...	Barcoo Pastoral Society ...	...	28 and 29 May	
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Bconah ...	Fassifern and Dugandan Agricultural and Pastoral Association	C. E. Mackenzie ...	27 and 28 June	13 and 14 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine) ...	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	H. J. Johnson ...		
Brishbane ...	National Agricultural and Industrial Association of Queensland	Charles A. Arvier	13, 14, 15, 16, and 17 Aug.	10, 11, 12, 13, 14, & 15 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brishbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruit-growers' Association	G. O. Burnett ...		
Buderim Mt. ...	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...	29 and 30 May	
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary ...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	J. Reid ...	5 and 6 Sept.	20 and 21 July
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		
Cairns ...	Hambleton Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...	14 and 15 May	
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	18 and 19 June	
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	A. Eastaughffe ...	12, 13, and 14 June	
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ..		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...	31 Aug.	
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...	...	16 Sept.
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	...	8 June
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ...	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	30 April	26 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ...		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	25 and 26 June	9 and 10 June
Gayndah ...	Reid's Creek Farmers' Progress Association	P. A. Fortescue ...		
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	J. R. Hamilton ...	15 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Canegrowers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...	23 Jan.	
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...	3 and 4 April	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...	21 and 22 Aug.	
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ..		
Gympie ...	Gympie Horticultural Society ...	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharpy, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Withcott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway	1 April	
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...	...	14 and 15 Aug.
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson		
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	17 Oct.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...	19, 20, and 21 June	
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour...		
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	...	29 and 30 Aug.	10 and 11 June
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	C. C. Ridley ...		
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...	6 and 7 May	
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	Sept.	24 June
Ma Ma Creek, via Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	4 and 5 June	17 and 18 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruickshank ...	3 and 4 June	
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	22, 23, and 24 May	24, 25, and 26 June

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Miriam Vale	Miriam Vale Farmers' Association	J. Spencer ...		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	C. J. Wyer ...		
Mooloolah ..	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelipa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	25 and 26 April	
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	9 Oct.
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	...	10 and 11 July
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	...	9 Sept.
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz ...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	30 Jan.	29 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...	August (Date not fixed)	
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	20, 21, and 22 June	11, 12, and 13 June
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson	16 and 17 July	
Roma ...	Yingerbay Farmers' Association	R. Frederick ...		
Roma (Blythdale)	Warooby Farmers' Association	Geo. Munt...		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ...	Farmers' Club	P. H. Adams ...	29 and 30 May	15 and 16 July
Southport ...	Southport Horticultural Society	E. Fass ...		25 Sept.
Springure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springure ...	The Springure Pastoral and Agricultural Society	H. E. Laver ...		30 April

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	21 and 22 Feb.	20 and 21 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...	7 and 8 May	
Sydney ...	Royal Agricultural Society of New South Wales	...	7, 8, 9, and 10 Aug.	
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	S. E. Tooth ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...		
Tingoora ...	Tingoora Farmers' Progress Association	Jas. McKenzie ..	6, 7, 8, and 9 Aug.	
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...	2 and 3 July	
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	12, 13, and 14 Feb.	
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...	18 Sept.	
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloomgabby	Queensland Dairy Herdbook Society	Alfred Gorrie ...		
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	...	15 and July
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yingerbay ...	United Farmers' Association of the Maranoa	R. Frederick ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	E. H. Decker ...	...	10 Oct.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1907.

Number of meetings held by the Society during 1907.

Date of the last meeting.

Name of the Secretary for 1908.

Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos. Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

"QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.

DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,
Principal Veterinary Surgeon and Bacteriologist.

**QUEENSLAND AGRICULTURAL COLLEGE.
FOR SALE.**

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. BOARS, 2 GUINEAS; SOWS, 1 GUINEA each; f.o.b. Gatton.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.
Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in June or July of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from sixteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Sixteen Years.

HERMITAGE STATE FARM.

FOR SALE.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Full particulars on application to THE MANAGER, State Farm, Hermitage.

STATE FARM, WESTBROOK.

GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlets: ONE SHILLING AND THREEPENCE per Dozen, or SEVEN SHILLINGS AND SIXPENCE per 100, f.o.b.

Seed is now ready for distribution. Price, 12s. 6d. per lb., or 1s. per packet, Post Free.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets and Freight.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam (<i>Ficus elastica</i>) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber (<i>Hevea braziliensis</i>) ...	Plants ...	„ „ ...	3d. each
„ „ „ „ ...	Seed ...	Feb. to April	1s. per oz. (about 1 doz.
Central American (<i>Castilloa elastica</i>) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
„ „ „ „ ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber (<i>Funtumia elastica</i>) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber (<i>Manihot Glaziovii</i>) ..	Seed only	„ „ ...	1s. per oz. (about 50)
West African Rubber (<i>Tabernaemontana</i>) ...	Plants ...	„ „ ...	6d. each, 5s. per doz.
„ „ „ (<i>Crassa</i>) ...	Seed ...	„ „ ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.ob. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.

CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.

2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.

3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.

4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,
Brisbane, 6th August, 1907.

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

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QUEENSLAND GOVERNMENT OFFICE,
Westminster Chambers, Victoria street, London, S.W.

“THE QUEENSLAND FLORA”

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COMMONWEALTH OF AUSTRALIA.

Customs and Excise Office,
Brisbane, 4th July, 1908.

COMMERCE ACT, 1905.

Export Regulations.

CIRCULAR.]

Delays by Exporters in furnishing the necessary Certificates under the *Commerce (Trade Descriptions) Act*, 1905, have recently occurred, and in some cases it has been stated that their neglect to conform with the Regulations in this matter was caused by difficulty in getting the Certificates issued in time.

2. The Department of Agriculture and Stock has now appointed an Officer to deal specially with the issue of Certificates, and this will obviate delays of the nature referred to.

3. Exporters are to see that in future Certificates are presented in all cases at the time of shipment of goods (except leather, regarding which special arrangements are made).

W. H. IRVING,
Collector of Customs.

IMPORTS OF FRUIT, ETC., INTO VICTORIA.

The following Regulations relating to the importation of fruit, plants, trees, &c., into the State of Victoria have been promulgated by the Victorian Minister for Agriculture:—

1. Inspectors are authorised and required to charge the following fees and expenses for examining citrus fruits imported, introduced, or brought into Victoria:—

For each case or package not exceeding one bushel in capacity, One halfpenny.

The inspection fee for bananas is now 1d. per bunch or case.

For each case or package exceeding one bushel in capacity, One penny.

2. Such fees and expenses shall be paid by the owner or the person in possession to the inspector.

IMPORTATION OF FRUIT OR PLANTS INTO NEW ZEALAND.

(Extract from the "New Zealand Gazette" of 27th February, 1908.)

By an Order in Council, gazetted on the 20th February, 1908, the New Zealand Government have revoked all previous Proclamations and Orders in Council, dated respectively from 6th July, 1897, to 22nd January, 1908, referring to the importations into New Zealand of grape vines—rooted and cuttings—fruit infested with Queensland fruit fly, scale-infested plants and fruit, or with apple scab or black spot, or potatoes infested with Irish blight, or potato moth.

The new regulations declare that the only ports of entry for fruit or plants are—for fruit only, Bluff; for fruit and plants, Auckland, Wellington, Christchurch, Dunedin. They also provide for the inspection of fruit on arrival at the above ports, and for fumigation or destruction of shipments unaccompanied by a certificate signed by the shipper, and another signed by an officer of the Department of Agriculture of the State where the fruit was grown, certifying that the fruit is clean and free from disease. Full particulars will be found by anyone interested in shipping fruit to New Zealand in the "New Zealand Gazette" of 27th February, 1908.

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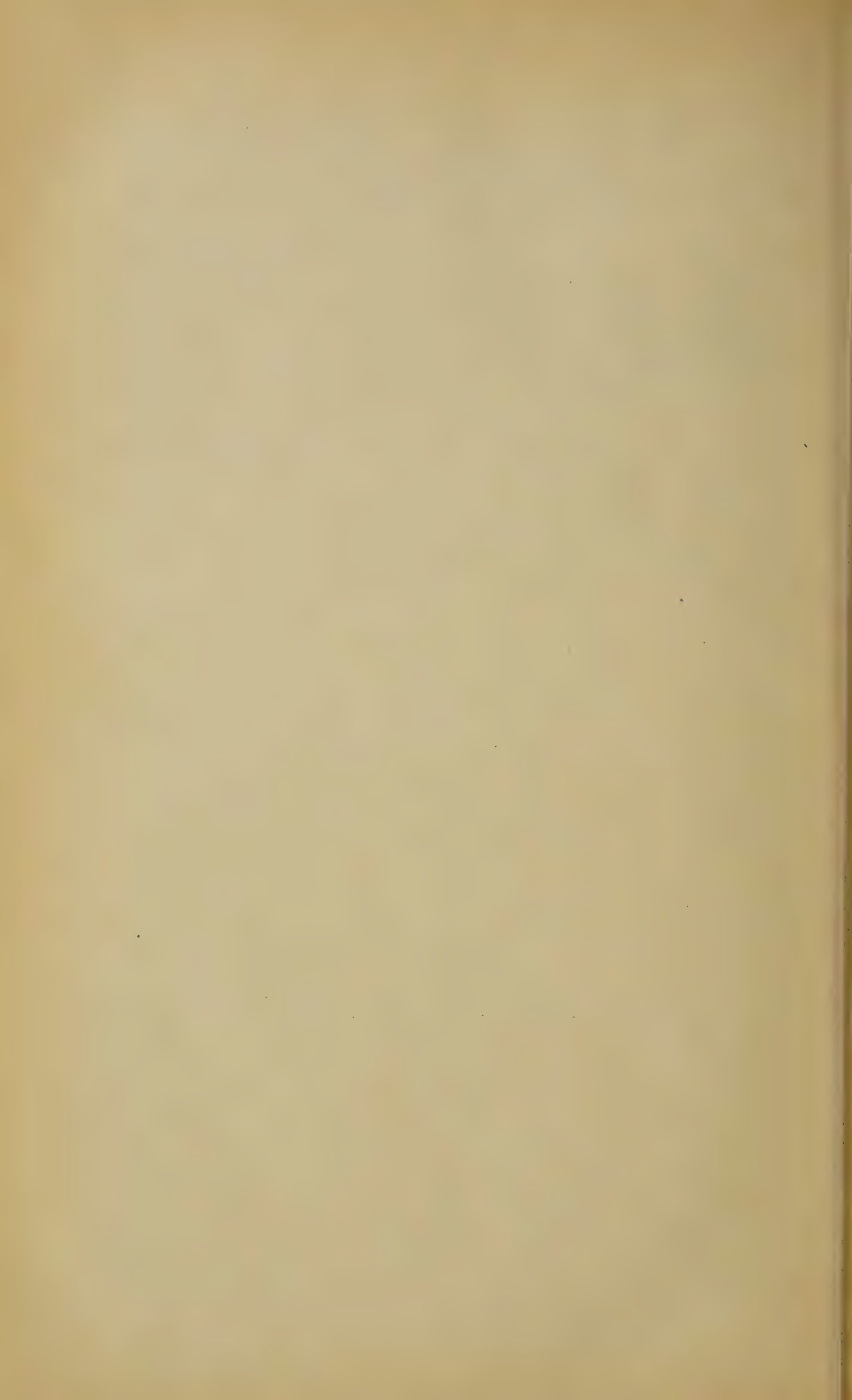
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LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	7 Feb.	11 and 12 Feb.
Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Barron Valley Agricultural, Pastoral, and Industrial Association	G. Bardon ...	24 and 25 July	
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	M. Selwyn Smith	1 May	
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	20 Sept.	3 and 4 Sept.
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	24 and 25 July	9 and 10 July
Blackall ...	Barcoo Pastoral Society ...	...	28 and 29 May	
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	C. E. Mackenzie ...	27 and 28 June	13 and 14 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine) ...	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	H. J. Johnson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	Charles A. Arvier	13, 14, 15, 16, and 17 Aug.	10, 11, 12, 13, 14, & 15 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairymen, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruitgrowers' Association	G. O. Burnett ...		
Buderim Mt. ...	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...	29 and 30 May	
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary ...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	J. Reid ...	5 and 6 Sept.	20 and 21 July
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		
Cairns ...	Hambleton Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...	14 and 15 May	
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	18 and 19 June	
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	A. Eastaughffe ...	12, 13, and 14 June	
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ...		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...	31 Aug.	
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...		16 Sept.
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin ...		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...		8 June
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ...	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	30 April	26 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ...		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	25 and 26 June	9 and 10 June
Gayndah ...	Reid's Creek Farmers' Progress Association	P. A. Fortescue ...		
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	J. R. Hamilton ...	15 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburrum, Bundaberg	Gooburrum Farmers and Canegrowers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...	23 Jan.	
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...	3 and 4 April	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...	21 and 22 Aug.	
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ..		
Gympie ...	Gympie Horticultural Society	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharry, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Withcott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway	1 April	
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...	...	14 and 15 Aug.
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson		
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	17 Oct.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...	19, 20, and 21 June	
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour...		
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	...	29 and 30 Aug.	10 and 11 June
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	C. C. Ridley ...		
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...	6 and 7 May	
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	Sept.	24 June
Ma Ma Creek, via Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	4 and 5 June	17 and 18 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruckshank ...	3 and 4 June	
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	22, 23, and 24 May	24, 25, and 26 June

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Miriam Vale	Miriam Vale Farmers' Association ...	J. Spencer ...		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	Hy. Hopkins ...		
Mooloolah ...	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	25 and 26 April	
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	9 Oct.
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	...	10 and 11 July
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	...	9 Sept.
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz ...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	30 Jan.	29 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...	August (Date not fixed)	
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	20, 21, and 22 June	11, 12, and 13 June
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson	16 and 17 July	
Roma (Blythdale)	Warrooby Farmers' Association ...	Geo. Munt... ..		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ...	Farmers' Club	P. H. Adams ...	29 and 30 May	15 and 16 July
Southport ...	Southport Horticultural Society ...	E. Fass ...		25 Sept.
Springsure ...	Queensland Pastoral Society...	G. R. Milliken ...		
Springsure ...	The Springsure Pastoral and Agricultural Society	H. E. Laver ...		30 April

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	21 and 22 Feb.	20 and 21 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...	7 and 8 May	
Sydney ...	Royal Agricultural Society of New South Wales	...	7, 8, 9, and 10 Aug.	
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...		
Takura (Pialba line)	Takura Farmers' Progress Association	S. E. Tooth ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...		
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...		
Tingoora ...	Tingoora Farmers' Progress Association	Jas. McKenzie ...	6, 7, 8, and 9 Aug.	
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...	2 and 3 July	
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...		
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...		
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	12, 13, and 14 Feb.	
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...	18 Sept.	
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...		
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...		
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore		
Woolloom-gabba	Queensland Dairy Herdbook Society	Alfred Gorrie ...		
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	...	15 and 16 July
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...		
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...		
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...		
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...		
Yingerbay ...	Yingerbay Farmers' Association ...	R. Frederich ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	E. H. Decker ...	...	10 Oct.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1907.

Number of meetings held by the Society during 1907.

Date of the last meeting.

Name of the Secretary for 1908.

Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos. Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

"QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.

DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,
Principal Veterinary Surgeon and Bacteriologist.

QUEENSLAND AGRICULTURAL COLLEGE.

FOR SALE.

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. £1 1s. each for Sows; £2 2s. each for BOARS.

LARGE BLACK PIGS, £2 2s. each for Sows; £3 3s. each for BOARS.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.
Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in June or July of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from sixteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Sixteen Years.

HERMITAGE STATE FARM.

FOR SALE.

SEVEN YOUNG PURE MERINO STUD RAMS, the Progeny of the CELEBRATED GLENGALLAN FLOCK, presented to the Government by Mr. W. B. Slade, Glengallan, at PRICES varying from £7 to £4 each.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Apply to THE MANAGER, Hermitage State Farm, near Warwick.

STATE FARM, WESTBROOK.

GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

All applications should reach the Manager before the end of June, to ensure First-class Selection.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlets: ONE SHILLING AND THREEPENCE per Dozen, or SEVEN SHILLINGS AND SIXPENCE per 100, f.o.b.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets and Freight.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam (<i>Ficus elastica</i>) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber (<i>Hevea braziliensis</i>) ...	Plants ...	" " ...	3d. each
" " " " " " }	Seed ...	Feb. to April	1s. per oz. (about 1 doz.
Central American (<i>Castilloa elastica</i>) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
" " " " " " ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber (<i>Funtumia elastica</i>) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber (<i>Manihot Glaziovii</i>) ..	Seed only	" " ...	1s. per oz. (about 50)
West African Rubber (<i>Tabernaemontana</i>) ...	Plants ...	" " ...	6d. each, 5s. per doz.
" " " (Crassa) ...	Seed ...	" " ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.ob. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.

CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.

2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.

3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.

4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,
Brisbane, 6th August, 1907.

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters
in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15
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Copies can likewise be obtained from Booksellers on the Mining Fields of
the State and in the Australasian Capitals. Also, from the

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Westminster Chambers, Victoria street, London, S.W.

“THE QUEENSLAND FLORA”

BY F. MANSON BAILEY, F.L.S.,

Colonial Botanist of Queensland.

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

IN SIX PARTS, OF BETWEEN 300 AND 400 PAGES EACH, ROYAL OCTAVO.

Price, £1 10s. for Complete Work.

Obtainable at the DEPARTMENT of AGRICULTURE and STOCK.

COMMONWEALTH OF AUSTRALIA.

Customs and Excise Office,

Brisbane, 4th July, 1908.

COMMERCE ACT, 1905.

Export Regulations.

CIRCULAR.]

Delays by Exporters in furnishing the necessary Certificates under the *Commerce (Trade Descriptions) Act*, 1905, have recently occurred, and in some cases it has been stated that their neglect to conform with the Regulations in this matter was caused by difficulty in getting the Certificates issued in time.

2. The Department of Agriculture and Stock has now appointed an Officer to deal specially with the issue of Certificates, and this will obviate delays of the nature referred to.

3. Exporters are to see that in future Certificates are presented in all cases at the time of shipment of goods (except leather, regarding which special arrangements are made).

W. H. IRVING,

Collector of Customs.

IMPORTS OF FRUIT, ETC., INTO VICTORIA.

The following Regulations relating to the importation of fruit, plants, trees, &c., into the State of Victoria have been promulgated by the Victorian Minister for Agriculture:—

1. Inspectors are authorised and required to charge the following fees and expenses for examining citrus fruits imported, introduced, or brought into Victoria:—

For each case or package not exceeding one bushel in capacity, One halfpenny.

The inspection fee for bananas is now 1d. per bunch or case.

For each case or package exceeding one bushel in capacity, One penny.

2. Such fees and expenses shall be paid by the owner or the person in possession to the inspector.

IMPORTATION OF FRUIT OR PLANTS INTO NEW ZEALAND.

(Extract from the "New Zealand Gazette" of 27th February, 1908.)

By an Order in Council, gazetted on the 20th February, 1908, the New Zealand Government have revoked all previous Proclamations and Orders in Council, dated respectively from 6th July, 1897, to 22nd January, 1908, referring to the importations into New Zealand of grape vines—rooted and cuttings—fruit infested with Queensland fruit fly, scale-infested plants and fruit, or with apple scab or black spot, or potatoes infested with Irish blight, or potato moth.

The new regulations declare that the only ports of entry for fruit or plants are—for fruit only, Bluff; for fruit and plants, Auckland, Wellington, Christchurch, Dunedin. They also provide for the inspection of fruit on arrival at the above ports, and for fumigation or destruction of shipments unaccompanied by a certificate signed by the shipper, and another signed by an officer of the Department of Agriculture of the State where the fruit was grown, certifying that the fruit is clean and free from disease. Full particulars will be found by anyone interested in shipping fruit to New Zealand in the "New Zealand Gazette" of 27th February, 1908.

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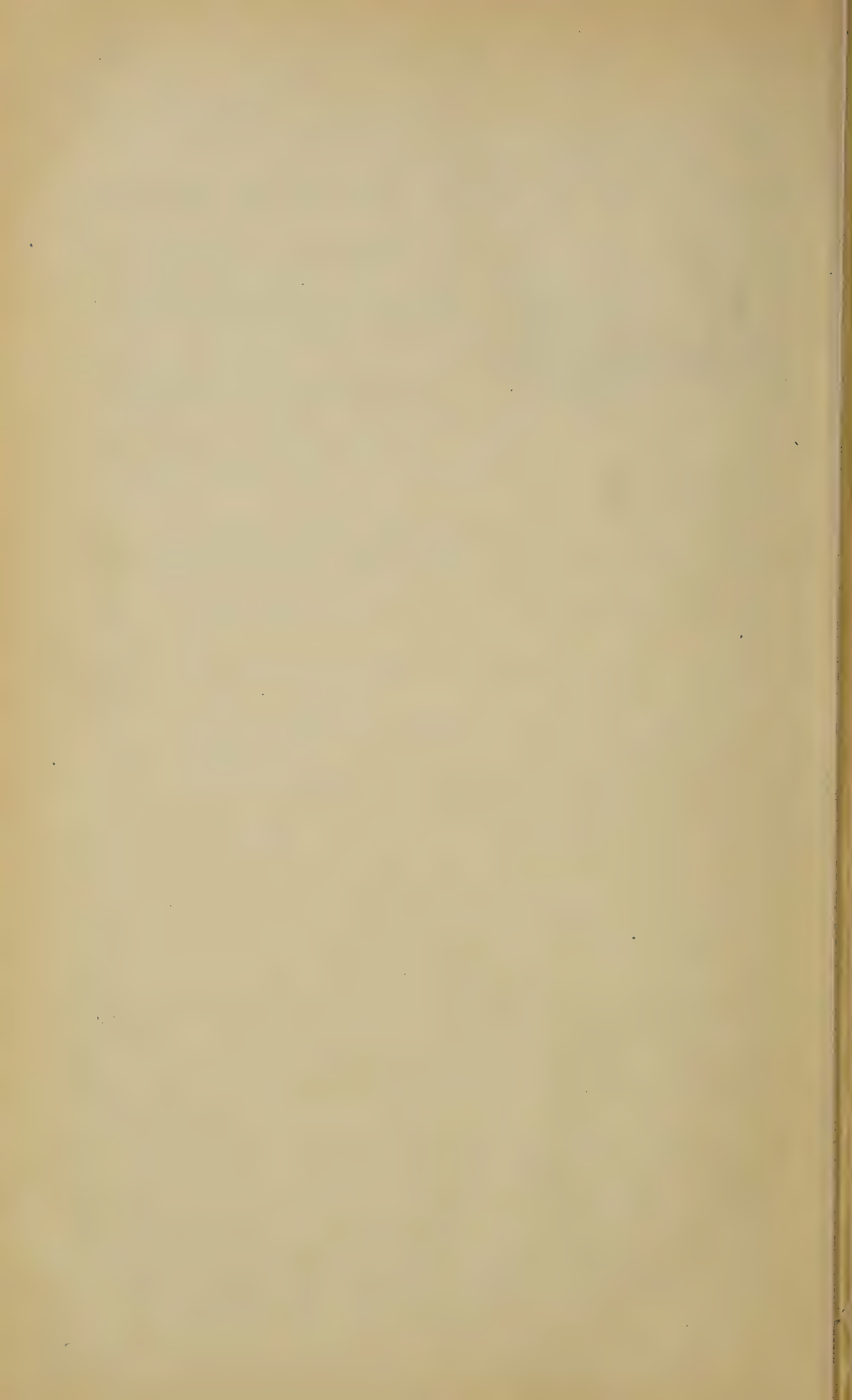
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LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
✓ Allora ...	Central Downs Agricultural and Horticultural Association	J. H. Buxton ...	7 Feb.	11 and 12 Feb.
✓ Allora ...	The Allora Farmers' Progress Association	P. Donovan ...		
Amby ...	Amby Farmers' Association ...	W. Jas. Sullivan ...		
Atherton ...	Barron Valley Agricultural, Pastoral, and Industrial Association	G. Bardon ...	24 and 25 July	
Atherton ...	The Atherton District Farmers' Association	Fredk. Stewart ...		
Ayr ...	Lower Burdekin Farmers' Association	G. S. Mackersie ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	I. A. Holmes ...		
Beaudesert ...	Logan and Albert Pastoral and Agricultural Society	M. Selwyn Smith	1 May	
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Wilson Holliday ...	20 Sept.	3 and 4 Sept.
Beenleigh ...	Logan Farming and Industrial Association	Wm. G. Winnett, Loganlea		
Belli Creek, via Eumundi	Belli Creek Farmers' Progress Association	A. W. Richardson		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	24 and 25 July	9 and 10 July
Blackall ...	Barcoo Pastoral Society ...	...	28 and 29 May	
Blackbutt ...	Farmers' Progress Association ...	John Dreghorn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	C. E. Mackenzie ...	27 and 28 June	13 and 14 May
Booyal ...	Booyal Farmers' Progress Association	N. Rosenlund ...		
Bowen ...	Pastoral, Agricultural, and Mining Association	A. W. Kirke ...		
Bowen ...	Proserpine Farmers and Settlers' Association	J. Cooper ...		
Bowen(Proserpine)	Cannon Valley Farmers and Settlers' Association	J. H. Ryan ...		
Bowen ...	Bowen Farmers and Fruitgrowers' Association	H. C. Smethurst ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodruffe ...		
Brisbane ...	Queensland Acclimatisation Society	H. J. Johnson ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	Charles A. Arvier	13, 14, 15, 16, and 17 Aug.	10, 11, 12, 13, 14, & 15 Aug.
Brisbane ...	United Pastoralists' Association ...	Fredk. Ranson ...		
Brisbane ...	Queensland Beekeepers' Association	F. Wilsdon Smith		
Brisbane ...	Queensland Chamber of Agriculture	F. W. Peek ...		
Brisbane ...	Queensland Citrus-growers' Association	R. M. Cooper ...		
Brisbane ...	Combined Moreton Association ...	Wm. Ewart ...		
Brookfield ...	The Brookfield and Pullen Vale Farmers, Dairy-men, and Fruitgrowers' Association	W. R. Moon ...		
Buderim ...	Buderim Mountain Coffee and Fruit-growers' Association	G. O. Burnett ...		
Buderim Mt.	North Coast Central Association ...	James Lindsay ...		
Bundaberg ...	Bundaberg Horticultural and Industrial Society	H. E. Ashley ...		
Bundaberg ...	Council of Agriculture ...	H. J. Page ...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	H. J. Page ...	29 and 30 May	
Bundaberg ...	Woongarra Canegrowers and Farmers' Association	M. W. Walker ...		
Burpengary...	Burpengary Farmers' Association ...	F. W. Uhlmann ...		
Cairns ...	Aloombah Farmers' Association ...	N. P. Petersen ...		
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	J. Reid ...	5 and 6 Sept.	20 and 21 July
Cairns ...	Cairns District Coffee-growers' Association	L. Battinson ...		
Cairns ...	Cairns District United Farmers' Association	Wm. Griffin ...		
Cairns ...	Hambleton Planters' Association ...	A. W. Hawkins ...		
Cardwell ...	Rockingham Progress Association ...	T. E. Fitzsimmons		
Cawdor ...	Highfields and Cawdor Farmers' Association	H. Franken ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Cedar Pocket, <i>via</i> Gympie	Cedar Pocket Farmers' Progress Association	Samuel Ericksen ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	G. M. Bell ...	14 and 15 May	
Charters Towers	Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	18 and 19 June	
Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Childers ...	Isis Agricultural Association ...	H. Epps ...		
Childers ...	Doolbi Mill Branch, Isis Agricultural Association	R. S. Rankin ...		
Childers ...	Childers Mill Branch, Isis Agricultural Association	H. Epps ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	W. S. Henderson ..	12, 13, and 14 June	
Childers ...	The Childers Mill Canegrowers' Association	A. Eastaughffe ...		
Clermont ...	Peak Downs Pastoral, Horticultural, and Agricultural Society	F. Leysley ...		
Cleveland ...	Cleveland Horticultural Society ...	Miles R. Fox ...	31 Aug.	
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. J. B. Just ...		16 Sept.
Columboola ...	The Columboola Farmers and Settlers' Association	Geo. T. Sutton ...		
Coochin ...	The Coochin Farmers' Progress Association	J. T. W. McLaughlin		
Cooktown ...	Cook District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...		8 June
Cooyar ...	Yeraman Creek Farmers' Progress Association	M. Harland ...		
Cooran ...	Cooran Progress and Agricultural Association	A. G. Bosanquet ...		
Crow's Nest	The Crow's Nest Agricultural and Horticultural Society	James Gleeson ...		
Croydon ...	The Gulf Mining, Pastoral, and Industrial Association	V. Creagh ...		
Cunnamulla	South Warrego Pastoral Association	J. Winward ...		
Dalby ...	Northern Downs Pastoral and Agricultural Association	E. Watt ...		
Dallarnil Scrub, <i>via</i> Degilbo	Dallarnil Farmers and Dairymen's Progress Association	H. J. Piper ...		
Dugandan ...	Dugandan Farmers' Progress Association	John M. Court ...		
Dundowran, <i>via</i> Maryborough	Dundowran and Takura Settlers' Association	H. J. E. Tooth ...		
Esk ...	Esk Agricultural, Pastoral, and Industrial Society	J. G. Smith ...	30 April	26 May
Eudlo ...	Eudlo Farmers and Fruitgrowers' Progress Association	Walter T. Jeremy		
Flagstone Ck., <i>via</i> Helidon	Flagstone Creek Farmers' Progress Association	Geo. J. Deller ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	Wm. Jones ...		
Fordsdale, <i>via</i> Grantham	The Fordsdale and Mount White-stone Farmers' Progress Association	W. M. Ridley ..		
Gayndah ...	Gayndah Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephenson	25 and 26 June	9 and 10 June
Gayndah ...	Reid's Creek Farmers' Progress Association	P. A. Fortescue ...		
Geraldton ...	Johnstone River Sugar-growers and Manufacturers' Association	W. Stevenson ...		
Gin Gin ...	Currajong and Gin Gin Agricultural and Pastoral Society	J. R. Hamilton ...	15 June	3 June
Gladstone ...	Gladstone Pastoral and Agricultural Association	W. J. Manning ...		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...		
Gooburru, Bundaberg	Gooburru Farmers and Cane-growers' Association	W. J. Tutin ...		
Goombungee	Goombungee Farmers' Association ...	Thos. Smith ...	23 Jan.	
Goondiwindi	MacIntyre River Pastoral and Agricultural Society	E. T. Drake ...	3 and 4 April	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Gracemere ...	The Gracemere District Farmers and Progress Association	Arthur E. Fisher ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. Vaughan ...	21 and 22 Aug.	
Gympie ...	Chatsworth Farmers' Progress Association	W. Allen ..		
Gympie ...	Gympie Horticultural Society	Charles Brasch ...		
Gympie ...	Woondum and Brisbane Road Farmers' Progress Association	J. Mullaly ...		
Harrisville ...	Harrisville Farmers' Progress Association	W. J. Burnett ...		
Hatton Vale	Hatton Vale Farmers' Progress Association	P. Sharpy, junr. ...		
Headington Hill	Queensland Farmers' Association ...	J. E. Stehn ...		
Helidon ...	Helidon Scrub Farmers' Progress Association	James Sweeney ...		
Helidon ...	Monkey Creek Farmers' Progress Association, Witheott, Helidon	Thomas Turner ...		
Hendra ...	Nundah Agricultural, Horticultural, and Industrial Association	Geo. A. Patullo ...		
Herbert River	Halifax Planters' Club ...	A. Campbell ...		
Herbert River	Macknade Farmers' Association ...	Edwin S. Waller ...		
Herbert River	Fairford Farmers' Association ...	D. G. Scott ...		
Herbert River	United Farmers' Association ...	D. G. Scott ...		
Herberton ...	Mining, Pastoral, and Agricultural Association	John M. Hollway	1 April	
Hodgson ...	Hodgson and Dargal Farmers' Association	I. Stevenson ...		
Hopetoun ...	Hopetoun Pastoral, Agricultural, and Progressive Association	John Walsh ...		
Hughenden ...	Hughenden Pastoral and Agricultural Association	H. G. McLean ...		
Ingham ...	Herbert River Pastoral and Agricultural Association (Agricultural Show)	P. J. Cochrane ...	...	14 and 15 Aug.
Ingham ...	Stone River Farmers' Association ...	W. B. G. Johnson		
Ipswich ...	Ipswich and West Moreton Agricultural and Horticultural Society	W. J. McGill ...	17 Oct.	
Ipswich ...	Queensland Pastoral and Agricultural Society	G. W. Allen ...	19, 20, and 21 June	
Ipswich ...	The Amberley Farmers' Progress Association	Clark T. Seymour ...		
Ithaca ...	Ithaca Progress Association ...	Jas. Greenaway ...		
Kelsey Creek via Bowen	Kelsey Creek Farmers' Progress Association	A. Fontaine ...		
Kolan, North	Kolan Canegrowers and Farmers' Association	Jas. H. Hendy ...		
Kilkivan ...	Kilkivan District Farmers and Settlers' Progress Association	M. Bambling ...		
Kingaroy ...	Kingaroy Farmer's Association ...	C. H. Hooper ...		
Kingaroy ...	South Burnett Agricultural, Pastoral, and Industrial Society	F. G. Hester ...	29 and 30 Aug.	28 and 29 April, 1909
Kooroongarra	Kooroongarra Farmers' Progress Association	A. E. Markey ...		
Laidley ...	Lockyer Agricultural and Industrial Society (at Gatton)	W. A. McIlwraith		
Lakeside ...	Mungore Farmers' Association ...	C. C. Ridley ...		
Longreach ...	Longreach Pastoral and Agricultural Society	J. P. Peterson ...	6 and 7 May	
Lowood ...	The Lowood and Tarampa Pastoral and Agricultural Association	D. E. C. Kroger ...	Sept.	24 June
Ma Ma Creek, via Grantham	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Mackay ...	Agricultural, Pastoral, and Mining Association	F. Black ...		
Mackay ...	Pioneer River Farmers and Graziers' Association	J. P. Moule ...	4 and 5 June	17 and 18 June
Mapleton ...	Fruitgrowers and Farmers' Progressive Association	W. J. Smith ...		
Mareeba ...	Mareeba Mining, Pastoral, and Agricultural Association	F. Cruckshank ...	3 and 4 June	
Maryborough	Maryborough Horticultural Society...	A. H. Jones ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Maryborough	The Island Farmers' Progress Association	H. Simpson, junr.		
Maryborough	Wide Bay and Burnett Agricultural and Horticultural Society	A. H. Jones ...	22, 23, and 24 May	24, 25, and 26 June
Miriam Vale	Miriam Vale Farmers' Association ...	J. Spencer ...		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	Hy. Hopkins ...		
Mooloolah ...	Mooloolah Farmers and Fruitgrowers' Progress Association	G. S. Skerman ...		
Mosman ...	Mosman Farmers' Association ...	R. D. Rex ...		
Mount Cotton	Mount Cotton and Redland Bay Fruitgrowers and Farmers' Association	W. E. Burns ...		
Mount Mee...	Mount Mee Farmers' Association ...	Jas. H. Robinson ...		
Mount Morgan	Mount Morgan Agricultural, Pastoral, and Poultry Society	J. S. Lyle ...		
Nambour ...	Dulong and Kureelpa Farmers and Canegrowers' Association	A. A. Petrie ...		
Nambour ...	Obi Obi Farmers and Dairymen's Progressive Association	H. Robinson ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mineral Society	J. W. Sigley ...	25 and 26 April	
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	H. Cecil Colledge	9 Oct.	9 Oct
North Isis ...	North Isis Canegrowers' Association	T. E. Barnes ...		
North Pine ...	Moreton Agricultural, Horticultural, and Industrial Association	D. McQ. Fraser ...	...	10 and 11 July
Oakey, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Thos. H. Gordon...		
Oakey ...	Oakey Agricultural and Pastoral Society	E. R. Pace ...	...	9 Sept.
Palmwoods ...	Palmwoods Industrial Fruitgrowers' Progress Association	H. Taylor ...		
Peachester, <i>via</i> Beerwah, N.C. Line	The Peachester Progress Association	W. Vieritz ...		
Pelican ...	The Pelican Farmers and Settlers' Progress Association	W. Budden ...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	John J. Daniel, senr.	30 Jan.	29 Jan.
Pomona ...	Pomona Agricultural and Progress Association	H. J. Scott ...		
Port Douglas	Port Douglas and Mosman Pastoral, Agricultural, Horticultural, and Mining Association	H. McMahon ...	August (Date not fixed)	
Proserpine ...	Preston Farmers and Settlers' Association	T. Duval ...		
Proserpine ...	Preston Farmers and Canegrowers' Association	R. C. Dagg ...		
Proserpine ...	Cannon Valley and District Farmers' Progress Association	W. A. Compton ...		
Queenton, <i>via</i> Charters Towers	Charters Towers Planters' Association	Jas. Frostick ...		
Roadvale ...	Roadvale Progress Association ...	Henry Clark ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		
Rockhampton	Central Queensland Farmers and Selectors' Association	T. Whitely, Coowonga		
Rockhampton	Central Queensland Stockowners' Association	R. R. Dawbarn ...		
Rockhampton	Rockhampton Agricultural Society...	A. C. Lyons ...	20, 21, and 22 June	11, 12, and 13 June
Roma ...	Western Pastoral and Agricultural Association of Queensland	Angus McPherson	16 and 17 July	
Roma (Blythdale)	Warooby Farmers' Association ...	Geo. Munt...		
Roma ...	Euthulla Farmers and Fruitgrowers' Association	J. Bates ...		
Roma ...	The United Maranoa Farmers' Association	R. Frederick, senr.		
Rosewood ...	Farmers' Club ...	P. H. Adams ...	29 and 30 May	15 and 16 July

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1907.	1908.
Southport ...	Southport Horticultural Society ...	E. Fass ...	...	25 Sept.
Springsure ...	Queensland Pastoral Society...	G. R. Milliken ...	...	...
Springsure ...	The Springsure Pastoral and Agricultural Society	H. E. Laver ...	...	30 April
Stanthorpe ...	Border Pastoral, Agricultural, and Mining Society	Geo. Simcocks ...	21 and 22 Feb.	20 and 21 Feb.
St. George ...	Balonne Pastoral and Agricultural Society	T. M. Cummings ...	7 and 8 May	...
Sydney ...	Royal Agricultural Society of New South Wales	...	7, 8, 9, and 10 Aug.	...
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	P. Summerville ...	...	...
Takura (Pialba line)	Takura Farmers' Progress Association	S. E. Tooth ...	...	...
Teutoberg ...	Teutoberg Farmers' Progress Association	E. M. Nothling ...	...	...
Tinana ...	Tinana Fruitgrowers and Farmers' Association	H. G. Habler ...	...	...
Tingoora ...	Tingoora Farmers' Progress Association	Jas. McKenzie ...	6, 7, 8, and 9 Aug.	...
Toowoomba...	Royal Agricultural Society of Queensland	G. A. Leichney ...	...	...
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association (formerly North Queensland Pastoral and Agricultural Association)	J. N. Parkes ...	2 and 3 July	...
Upper Kedron	Upper Kedron Fruitgrowers and Farmers' Association	A. Marshall ... A. Pickering ...	...	...
Wallumbilla	Wallumbilla Farmers' Association ...	A. Budd ...	...	...
Warren ...	Woodend Farmers' Club ...	W. Lehfeldt ...	...	...
Warren Siding	The Stanwell United District Farmers' Union	G. N. Terry ...	...	...
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ...	12, 13, and 14 Feb.	...
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...	18 Sept.	...
West Haldon, <i>via</i> Greenmount	West Haldon Farmers' Progress Association	A. E. Ayris ...	...	...
Wondai ...	Mondure Farmers' Progress Association	S. R. Monteith ...	...	...
Wondai ...	Wondai Farmers' Progress Association	W. W. Finnimore	...	...
Woolloomgabby	Queensland Dairy Herdbook Society	Alfred Gorrie ...	...	...
Woombye ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	P. S. Hungerford...	...	15 and 16 July
Woombye ...	Woombye Fruitgrowers' and Progress Association	E. E. McNall ...	...	...
Wooroolin ...	Wooroolin Farmers' Progress Association	A. Deighton ...	...	...
Wooroolin (Memerambi Siding)	Memerambi Farmers' Progress Association	J. E. Reid ...	...	...
Yandina ...	Yandina Agricultural and Progress Association	W. R. Brayden ...	...	...
Yingerbay ...	Yingerbay Farmers' Association ...	R. Frederich ...	...	...
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	E. H. Decker ...	...	10 Oct.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1907.

Number of meetings held by the Society during 1907.

Date of the last meeting.

Name of the Secretary for 1908.

Departmental Announcements.

The EDITOR will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the EDITOR, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, covers in boards and cloth will be supplied from this office on application to the Under Secretary for Agriculture and Stock. Applications must be accompanied by a remittance of SIXPENCE to cover cost. For the convenience of those who are not within reach of a bookbinder, a Special Cover has been designed, which obviates the necessity for binding. These covers will be supplied at ONE SHILLING each.

In order to avoid disappointment, correspondents who wish for replies to questions in the *Journal* are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

For the information of those who are desirous of communicating with the managers of State farms, we give their names and addresses below:—Queensland Agricultural College, Gatton, principal, J. Mahon; Westbrook State Farm, Westbrook, manager, C. Ross; Biggenden State Farm, Biggenden, manager, D. Macpherson; Hermitage State Farm, Warwick, manager, John Liverseed; Gindie State Farm, manager, R. Jarrott; Kamerunga State Nursery, Cairns, manager, Howard Newport; Roma State Farm, manager, R. Soutter; State Farm, "Warren," Stanwell, manager, Thos. Jones; Botanic Gardens, director, J. F. Bailey.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

THE BOUNTIES ACT.

The Department of Agriculture and Stock have received from the Comptroller-General of Customs, Melbourne, a number of copies of "Memorandum for Information of Growers" and "Form of Notice of Intention to Claim Bounty" under the Commonwealth Bounties Act. Should any grower desire a copy of either the above, same will be supplied upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

"QUEENSLAND AGRICULTURAL JOURNAL."—GENERAL INDEX, VOLS. I. TO XIX.

The GENERAL INDEX may be obtained on application to the Under Secretary, Department of Agriculture and Stock. Price: ONE SHILLING.

DIRECTIONS FOR FORWARDING SPECIMENS

(ENTOMOLOGY AND PLANT PATHOLOGY).

NOTE.—Experience has shown that the opportunity of seeking the advice of the Entomologist and Vegetable Pathologist has not been embraced, owing to the lack of information regarding proper procedure for the transmission of specimens; also, that satisfactory information has not been accorded when, although this has not been the case, either no specimens at all have accompanied the application or such only as on arrival have been found to be—by reason of their condition—unsuitable for examination. Under these circumstances, the following Directions are issued for public information:—

INSECTS.

If it be desired that the insects be received whilst still alive, some of the food-plant—not superficially wet, however—should be included in the box containing them, and, also, a little dry crushed paper, as an absorbent of moisture. Insects frequenting soil—or wood—should be sent in these matter, and generally insects injurious to articles derived from plants or animals or to manufactured products should be forwarded in samples of these articles or substances. Holes should not be made in the boxes used, unless quite exceptionally—when they should be limited to two or three, and be quite small.

Plants or portions of plants, including fruit, tubers, &c., that may illustrate insect injury, should be sent as directed for plants subject to disease proper. (*See* “Plant Diseases.”) Such specimens may be of great interest.

Generally speaking, insects should be forwarded in a dead condition, the killing having been effected by the “cyanide bottle,” tobacco fumes or anæsthetic, for fragile examples—moths, flies, &c., for instance; and by these agencies or by immersion in spirits of wine, formalin, hot water, &c., for hard-bodied ones—beetles, plant-bugs, grasshoppers, &c.—and for insects generally not suffering damage through being made wet, such as caterpillars or grubs. Dead examples of the latter kinds should be sent in spirits of wine diluted with water 1 part in 4, formalin diluted with water 1 part in 20, or in gin or other alcoholic beverage; the phial containing them, completely filled with its contents, being packed in a “mailing tube,” perforated wooden block, section of bamboo stem, or strong box.

Hard-bodied insects that have been immersed in spirits or formalin may be removed from these fluids, and sent, whilst still moist, packed amidst sawdust to which a few drops of carbolic acid or oil of turpentine have been added; or, if killed in other ways, be allowed to become perfectly dry and packed then in this medicated substance, great care being exercised in handling in the latter case. Small insects, when dry, should be packed in shredded tissue paper scattered amongst them or between layers of this; cotton wool should never be used in contact with them.

Butterflies and moths should be sent pinned (in impaling them they should be placed on their sides and the pin thrust through their thorax or mid-body) to cork, cork linoleum, or pith fastened to the inside of the box. The finer lace pins are suitable for this purpose. Or butterflies—and moths in some instances—may be enclosed in papers folded into triangular-shaped packets, of sizes to match the respective insects, these afterwards being packed into a box with crushed paper, to prevent movement, and powdered “moth ball” (Naphthalene) to repel ants.

In some instances (Scale Insects, &c.) it will be necessary to send food-plant (bark, stem, or leaf) and insect in association, each such specimen being simply wrapped in soft paper.

PLANT DISEASES.

PLANTS AND PORTIONS THEREOF.

These, if practicable, should be forwarded carefully packed so as to arrive in a condition approaching that exhibited when they were first procured. They should not be externally wet, however, or even damp—much less should their surfaces be moistened. If roots accompany the specimens, care should be taken lest earth-particles therefrom soil the leaves or flowers; this may be secured by enclosing them in a paper or linen bag. Should circumstances not admit of their transmission in a fresh state, the specimens should be carefully dried between paper and under slight pressure only (not sufficient to quite flatten them out). They should be handled as little as possible either in gathering them, submitting them to this process, or in finally packing them. When being transmitted, they should be packed in soft paper between card or mill board. Any solid substance that will not quickly dry—roots or succulent stems, for example—and is liable to prompt decay, should be immersed in formalin 1 part in 20 water or in alcohol 1 part in 4 water prior to sending, and forwarded in this; or, after immersion for any period not less than 48 hours in one of these fluids, be taken out, wrapped in linen that has been moistened therewith, and enclosed in a tin box under conditions that will admit of moisture being conserved. In other cases—wood, fruit, tubers, &c.—the specimens may be forwarded securely packed in any ordinary manner.

GENERAL.

Specimens should be sent in fair number or amount, so as to afford the investigator full facilities for arriving at certain conclusions.

To identify insects and specimens generally with remarks submitted in writing relating to them, it is necessary that one example of each description in the packet, when this contains objects of more than one kind, be marked by having attached to it or otherwise associated with it a small label bearing a distinguishing number written in pencil. In the case of living specimens this should accompany each receptacle or packet devoted to the individuals of one kind.

When the names or other such facts of interest are sought, especially as aids in arranging collections of insects, &c., numbered duplicates should be sent, to be retained for reference or other purposes; it being understood that no return of specimens sent can be made generally, except by special arrangement.

POSTAL.

When specimens or the vessels containing them are liable to injury, either by concussion or pressure, whilst being transmitted, the package in which they are contained should be strong. Whilst fastened securely, this should not be done in such a way as to prevent inspection of its contents without its being broken. The address and stamp should be attached to a ticket distinct from the outside wrapper of the package, although this should bear the address repeated as well as the name of the sender. It should also be endorsed with a general statement of contents—*e.g.*, "Insects Only."

The charges for Packets by ordinary post are as follows:—1d. for 2 oz. or less, and 1d. for every additional ounce or portion thereof. For those by Parcel Post—6d. for 1 lb. or less, and 3d. for every additional pound or portion thereof.

The address should be an official one, *e.g.*—

The Entomologist—Department of Agriculture and Stock, Brisbane.

And in every case a letter of advice should accompany each consignment.

Under special circumstances, the objects and materials necessary for the collection, preservation, and transmission of specimens may be provided.

HENRY TRYON,

Entomologist and Vegetable Pathologist.

Department of Agriculture and Stock,
October, 1908.

DISEASES OF ANIMALS.—EXAMINATION OF SPECIMENS.

In accordance with an Order recently issued by the Minister for Agriculture, any persons deriving their principal means of livelihood from rural pursuits may have specimens, &c., examined by the Bacteriological Department free of charge. The Principal Veterinary Surgeon and Bacteriologist will, therefore, be glad at any time to make examination and report upon pathological specimens, &c., in connection with diseases of animals. When forwarding material, full particulars of the case should be given. The specimens should, where possible, be wrapped in a cloth saturated with disinfectant before placing in the receptacle, securely packed, and forwarded with the history thereof, carriage prepaid, as quickly as possible to the Department of Agriculture, Brisbane.

(Signed) S. DODD,
Principal Veterinary Surgeon and Bacteriologist.

QUEENSLAND AGRICULTURAL COLLEGE.
FOR SALE.

PURE-BRED PIGS, all from imported stock, including Berkshire and Large and Middle Yorkshires. £1 1s. each for Sows; £2 2s. each for BOARS.

LARGE BLACK PIGS, £2 2s. each for Sows; £3 3s. each for BOARS.

Poultry of the following breeds:—Brown Leghorns, Silver-grey Dorkings, Old English Spangled Game, Plymouth Rocks, Minorcas, White Wyandottes, Silver-laced Wyandottes, Black Orpingtons, Buff Orpingtons, White Leghorns. Prices, from 10s. each, f.o.b. Gatton.

Eggs of the above breeds are available in the season—1st July to 31st December; and nine out of each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced if returned carriage paid. This rule will be strictly adhered to. Price, 10s. per setting, for all breeds, f.o.b. Gatton.

Applications for Setting of Eggs, accompanied by Remittance, may be made to the Principal, Queensland Agricultural College.

A few Settings of American Bronze-wing Turkey Eggs will be available at 15s. per setting, f.o.b. Gatton.

As it has been decided that all surplus stock is to be disposed of by auction sales to be held annually, no pure-bred bulls will be available for private sale.

The following Stud Animals are available for Service at the College Farm, at a charge of 10s. for pure-bred and 5s. for grade cows:—Imported Shorthorn, Jersey, Holstein, and Guernsey Bulls.

The following Bulls imported from Great Britain are also available for Service at a charge of 10s. for all cows:—

Ayrshire Bull, SPECULATION.
Shorthorn Bull, BURTON SPOT.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Paspalum Roots will be supplied to purchasers at 2s. 6d. per sack, f.o.b. Gatton. Applicants will be supplied on receipt of remittance to the amount of the order.

Small quantities of Roots of the following Grasses will also be available for disposal:—Rhodes Grass, Wonder Grass.

Seeds for Sale:—Cowpea, Sunflower, Sorghums, Panicum.

JOHN MAHON, Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

TWENTY-SEVEN POUNDS per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes PRACTICAL AGRICULTURE in all its branches, DAIRYING, GARDENING, STOCK-BREEDING, and MECHANICAL ARTS. Classes are also held daily for THEORETICAL INSTRUCTION in these branches, as well as in SURVEYING, CHEMISTRY, &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in June or July of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from sixteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary, or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The AGE of CANDIDATES for Admission to the College as Students is Sixteen Years.

HERMITAGE STATE FARM.

FOR SALE.

SEVEN YOUNG PURE MERINO STUD RAMS, the Progeny of the CELEBRATED GLENGALLAN FLOCK, presented to the Government by Mr. W. B. Slade, Glengallan, at PRICES varying from £7 to £4 each.

PURE-BRED MIDDLE YORKSHIRE BOARS (Progeny of Imported Stock), £2 2s. each on rail at Hermitage.

TURKEY GOBBLERS, 11 months old, THIRTY SHILLINGS each on rail at Hermitage.

FOR SERVICE—

Middle Yorkshire Boar, HOLYWELL CHUB (Imported)

Berkshire Boar, YOUNG BOOMERANG (Imported).

Apply to THE MANAGER, Hermitage State Farm, near Warwick.

STATE FARM, WESTBROOK.

GRAPE CUTTINGS.

Over 50,000 for distribution, including 150 VARIETIES, at the following rates:—

Wine varieties, 15s. per 1,000; less quantities, 3s. per 100.

Table varieties, £1 per 1,000; less quantities, 4s. per 100.

All prices f.o.b. at Westbrook.

Application should be made direct to the MANAGER, State Farm, Westbrook, accompanied by a Remittance to cover Cost of Cuttings; and where delivery is to be taken at Prepaid Stations, the cost of Freight must be added.

Applicants should state where delivery is to be taken.

All applications should reach the Manager before the end of June, to ensure First-class Selection.

GRAPE CUTTINGS may also be obtained at the same prices from the ROMA STATE FARM, at BUNGEWORGORAI, on application to the Manager.

CANARY GRASS

(*Phalaris commutata*).

This is one of the best all-the-year-round grasses as yet introduced for Green Cutting, Hay, or Feeding-off. Planting should be done during the Winter and Early Spring, before hot dry weather sets in. It is particularly luxuriant in winter, and behaves remarkably well during the hot dry months. The Manager believes it will flourish in any part of the Commonwealth.

Rootlets: ONE SHILLING AND THREEPENCE per Dozen, or SEVEN SHILLINGS AND SIXPENCE per 100, f.o.b.

To expedite delivery, application should be made direct to the MANAGER, Westbrook State Farm, together with remittance to cover the cost of Rootlets and Freight.

STATE SCHOOLS will be supplied with Small Parcels of Rootlings of the above FREE OF CHARGE.

Applications, however, must include cost of freight.

POULTRY.

GOLDEN WYANDOTTE COCKERELS, from Heavy Laying Strains, FOR SALE. Price: SEVEN SHILLINGS AND SIXPENCE each. Apply to

THE MANAGER.

PURCHASE OF STOCK AND PRODUCE FROM THE DEPARTMENT OF AGRICULTURE.

—:O:—

Purchasers of Stock and Produce, Plants, Seed, &c., from the State Farms and Agricultural College are reminded that Sales from these Institutions are made for Cash only. Persons desirous of making purchases should, therefore, first ascertain the cost of whatever articles they desire to obtain, and remit the full purchase-money when sending an order.

STATE NURSERY, KAMERUNGA, CAIRNS.

RUBBER, COCOA, KOLA-NUT, CAROB BEAN, KAPOCK, VANILLA, CARDAMOM, BREADFRUIT, DIVI-DIVI, GINGER, AND OTHER VALUABLE TROPICAL ECONOMIC PLANTS FOR SALE, AT NOMINAL RATES, TO SETTLERS AND FARMERS.

The Instructor in Tropical Agriculture notifies that PLANTS or SEEDS of the above useful and valuable AUXILIARY PRODUCTS may be obtained by application to the Manager, Kamerunga State Nursery. PLANTS available at any time. SEEDS when in season, BEING MOSTLY OF SHORT VITALITY, should be promptly applied for.

RUBBERS, KAPOCK, CARDAMOM, and especially rare Plants, or Seedlings difficult to raise, 1s. each, or 10s. per dozen; others, 6d. each, or 5s. per dozen. Seed, 6d. per packet. Plus packing, railage, or postage.

Remittances should accompany applications.

Lists of Tropical Economic Plants available may be obtained on application to the Manager, Kamerunga State Nursery, Cairns, North Queensland.

RUBBER SEEDS AND PLANTS.

Variety and Name.	Plants or Seed.	When Available.	Price.
Rambong or Assam (<i>Ficus elastica</i>) ...	Plants only	Any time ...	1s. each, 10s. per doz.
Para Rubber (<i>Hevea braziliensis</i>) ...	Plants ...	" " ...	3d. each
" " " " ...	Seed ...	Feb. to April	1s. per oz. (about 1 doz.)
Central American (<i>Castilloa elastica</i>) ...	Plants ...	Any time ...	6d. each, 5s. per doz.
" " " " ...	Seed ...	Nov. to Jan.	1s. per oz. (about 100)
Iré or Logos Rubber (<i>Funtumia elastica</i>) ...	Plants only	Any time ...	1s. each, 12s. per doz.
Ceara Rubber (<i>Manihot Glaziovii</i>) ..	Seed only	" " ...	1s. per oz. (about 50)
West African Rubber (<i>Tabernaemontana</i>) ...	Plants ...	" " ...	6d. each, 5s. per doz.
" " " (<i>Crassa</i>) ...	Seed ...	" " ...	1s. per oz. (about 150)

Above prices are for delivery on the Nursery. If applicants wish Plants or Seed sent, packing, postages, railage to port, &c., are extra. Seed and small quantities of Plants may be sent by parcels post at purchaser's risk. Plants, being delicate, do not travel well by post.

Hessian-covered cases, holding one to three dozen, cost 4s. 6d. extra f.ob. Cairns, whence they will be shipped "freight on." The demand for Seed being large and the supply limited, Orders received, with remittance, will be booked and completed as soon as Seed is available.

* Owing to the limited supply of plants and seed available at the Nursery, settlers requiring large numbers may, by special arrangement of the Department, import in quantity from Singapore or elsewhere. See conditions attached.

CONDITIONS UNDER WHICH RUBBER SEEDS OR PLANTS MAY BE
IMPORTED INTO QUEENSLAND FROM SINGAPORE.

1. The Department of Agriculture and Stock, Brisbane, to be notified of intending importations.

2. The importer to give an undertaking that the seeds or plants shall, for at least three months after arrival in Queensland, remain in a place approved by the Department of Agriculture and Stock and be subject to such treatment as the Department may require.

3. No imported rubber seeds or plants are to be placed within one mile of a coffee-tree during the time of quarantine.

4. Seeds or plants imported from Singapore are to be accompanied by a certificate to the effect that they have been packed under the supervision of the Director of the Botanic Gardens, Singapore, and are quite free from disease.

Department of Agriculture and Stock,
Brisbane, 6th August, 1907.

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15 St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,
Westminster Chambers, Victoria street, London, S.W.

“THE QUEENSLAND FLORA”

BY F. MANSON BAILEY, F.L.S.,

Colonial Botanist of Queensland.

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

IN SIX PARTS, OF BETWEEN 300 AND 400 PAGES EACH, ROYAL OCTAVO.

Price, £1 10s. for Complete Work.

Obtainable at the DEPARTMENT of AGRICULTURE and STOCK.

COMMONWEALTH OF AUSTRALIA.

Customs and Excise Office,

Brisbane, 4th July, 1908.

COMMERCE ACT, 1905.

Export Regulations.

CIRCULAR.]

Delays by Exporters in furnishing the necessary Certificates under the *Commerce (Trade Descriptions) Act*, 1905, have recently occurred, and in some cases it has been stated that their neglect to conform with the Regulations in this matter was caused by difficulty in getting the Certificates issued in time.

2. The Department of Agriculture and Stock has now appointed an Officer to deal specially with the issue of Certificates, and this will obviate delays of the nature referred to.

3. Exporters are to see that in future Certificates are presented in all cases at the time of shipment of goods (except leather, regarding which special arrangements are made).

W. H. IRVING,

Collector of Customs.

IMPORTS OF FRUIT, ETC., INTO VICTORIA.

The following Regulations relating to the importation of fruit, plants, trees, &c., into the State of Victoria have been promulgated by the Victorian Minister for Agriculture:—

1. Inspectors are authorised and required to charge the following fees and expenses for examining citrus fruits imported, introduced, or brought into Victoria:—

For each case or package not exceeding one bushel in capacity, One halfpenny.

The inspection fee for bananas is now 1d. per bunch or case.

For each case or package exceeding one bushel in capacity, One penny.

2. Such fees and expenses shall be paid by the owner or the person in possession to the inspector.

IMPORTATION OF FRUIT OR PLANTS INTO NEW ZEALAND.

(Extract from the "New Zealand Gazette" of 27th February, 1908.)

By an Order in Council, gazetted on the 20th February, 1908, the New Zealand Government have revoked all previous Proclamations and Orders in Council, dated respectively from 6th July, 1897, to 22nd January, 1908, referring to the importations into New Zealand of grape vines—rooted and cuttings—fruit infested with Queensland fruit fly, scale-infested plants and fruit, or with apple scab or black spot, or potatoes infested with Irish blight, or potato moth.

The new regulations declare that the only ports of entry for fruit or plants are—for fruit only, Bluff; for fruit and plants, Auckland, Wellington, Christchurch, Dunedin. They also provide for the inspection of fruit on arrival at the above ports, and for fumigation or destruction of shipments unaccompanied by a certificate signed by the shipper, and another signed by an officer of the Department of Agriculture of the State where the fruit was grown, certifying that the fruit is clean and free from disease. Full particulars will be found by anyone interested in shipping fruit to New Zealand in the "New Zealand Gazette" of 27th February, 1908.

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Be Up to Date and Use the Very Latest and Best Appliances.



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The

JULY,
1908.

Queensland Agricultural Journal



For terms of Subscription
SEE PUBLIC ANNOUNCEMENTS.

FCM

Edited by
A. J. BOYD, F.R.G.S.Q.



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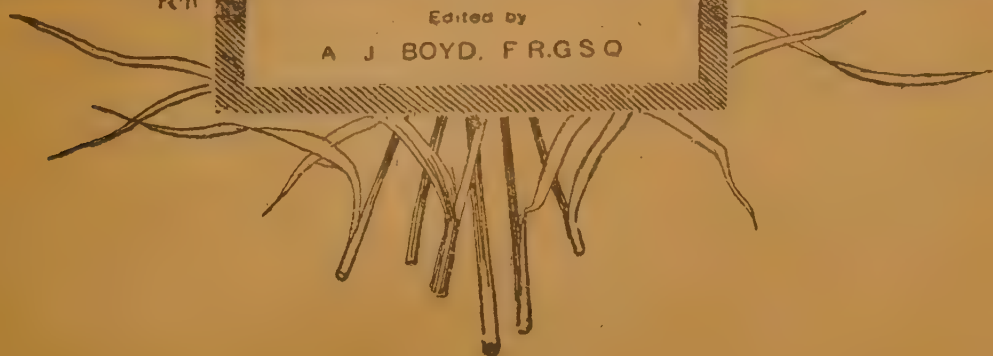
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VOL. XXI.

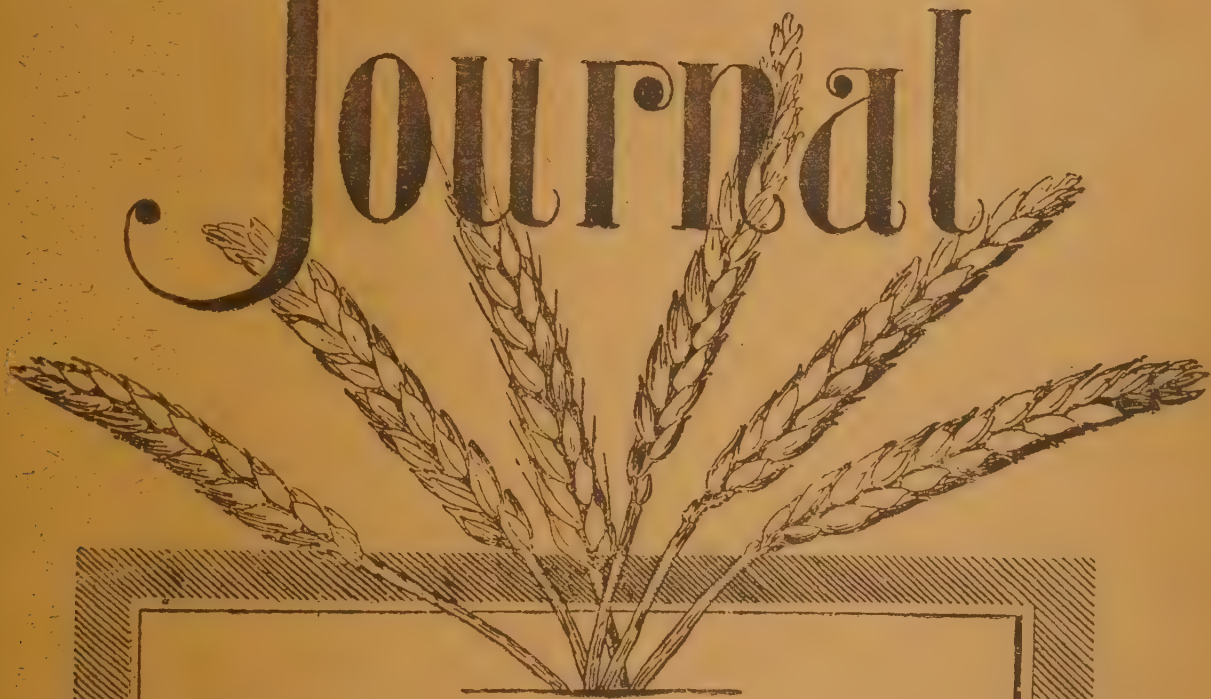
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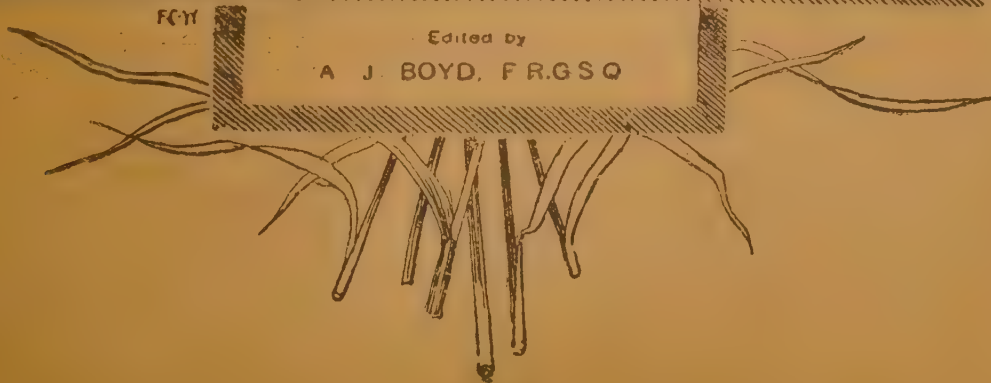
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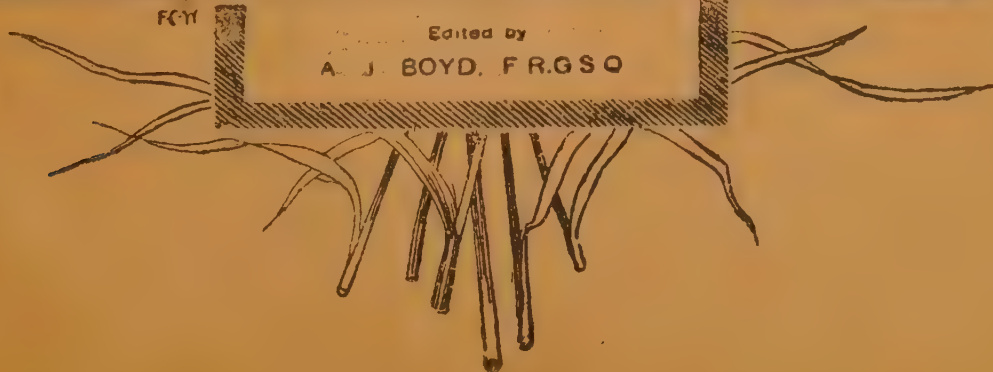
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